STUDENTS' LEARNING OF THRESHOLD CONCEPTS IN UNDERGRADUATE ECONOMICS

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Statement by supervisor

I, Suriamurthee M. Maistry, as the candidate's supervisor, agree / do not agree to the submission of this thesis.

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ABSTRACT

Economics is often experienced by students as a difficult subject. Disciplinary difficulty manifests internationally in high failure rates and concerns about the quality of learning and teaching in undergraduate economics. These concerns may be compounded in the South African higher education context, where academic underpreparedness among students is one of many challenges. There is a need to deepen qualitative understanding of students' learning in economics, and of ways in which it may be facilitated, which calls for a broader framing than the one inherent in the quantitative investigations of performance that predominate in economics education research in this country.

This study therefore set out to explore economics students' learning in a tutorial programme informed by the threshold concepts framework (Land et al., 2016; Meyer and Land, 2003) — a theoretical perspective that offers an encompassing view of disciplinary learning not previously used in this context. This was a qualitative, interpretive study informed by social constructivist principles in teaching and learning as well as research methodology. The case study was set in a threshold concepts-infused, peer-group discussion-centred tutorial programme based in Intermediate Microeconomics at the University of KwaZulu-Natal, and attended by twenty volunteers from the mainstream class. Interactive Qualitative Analysis (Northcutt and McCoy, 2004) was used to generate and analyze data: focus groups generated affinities (themes) reflecting students' learning, from which a system diagram was constructed. The affinities were elaborated in individual interviews, supplemented by participants' written reflections. Together the data provided rich descriptions of learning in the students' voices.

The primary driver of learning was the *Group Dynamics* affinity — peer interactions in the tutorials — which influenced the other affinities: the *Learning Journey* through disciplinary concepts and metalearning to *Economic Thinking*, the *Goals* that directed and mediated learning, the *Personal Outcomes* participants related, and the *Feelings* which pervaded and influenced the course of learning. The systemic nature of this representation of learning and the reciprocal influences among its elements could accommodate complexity and variation in students' experiences.

The thesis offers a graphical and conceptual representation of the experiences and processes of learning in the threshold concepts-infused programme, abstracted from participants' descriptions. This tentative model depicts disciplinary learning as a challenging and transformative process, requiring that students engage with both head (cognition and metacognition) and heart (conation, affect and identity). In this case, the pedagogy involving peer-group learning supported both aspects. If the discipline as experienced aligns with students' sense of self, learning is more likely to be experienced as meaningful, facilitating the engagement of students' inner resources to sustain academic commitment, and in turn enhancing cognitive and metacognitive development. This view of learning can open up our understanding of what it means to learn and to teach in economics and in higher education.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

ART	Affinity Relationship Table
CHE	Council on Higher Education
ETC	Embedding Threshold Concepts
IQA	Interactive Qualitative Analysis
IRD	Interrelationship Diagram
ITCK	Integrated Threshold Concept Knowledge
PBL	Problem-Based Learning
PsyCap	Psychological Capital
SAEF	School of Accounting, Economics and Finance
SEL	Student Experience of Learning
SID	Systems Influence Diagram
TC	Threshold Concepts
TCF	Threshold Concepts Framework
UKZN	University of KwaZulu-Natal
WTP	Ways of Thinking and Practising
ZPD	Zone of Proximal Development

CHAPTER 1
INTRODUCTION

1.1 Introduction

Economics is often experienced by students as a difficult subject. This difficulty may be attributable to the abstract nature of some of its concepts, the distinct way of thinking and analyzing problems it requires, or the way it is traditionally taught; it manifests in high failure and dropout rates, and in concerns about the quality of learning (and teaching) in undergraduate economics courses. These concerns recur in international scholarship (Colander & McGoldrick, 2009; Dubas & Toledo, 2016; Jackson & Ross, 2005); they are not particular to South Africa, although features of this country's higher education context may intensify the challenges faced by both students and teachers[1] of economics (Bokana & Tewari, 2014).

This study was motivated by my unanswered questions about economics students' learning. In my experience of teaching economics at a South African university, I have observed that some students seem to struggle to grasp fundamental disciplinary concepts and practices. This holds back their learning and affects progression in the discipline. Even among those who have passed introductory and intermediate levels, some appear unable to transfer their knowledge to subsequent courses, or to apply it meaningfully to interpret real-world events. Research in economics education in this country reflects concerns around poor academic performance and low throughput in undergraduate courses across universities. This work consists almost entirely of quantitative studies that investigate the impacts of students' characteristics or of educational interventions on performance. Little qualitative or conceptual enquiry has been undertaken, and understanding of how students learn economics in South African higher education is superficial. Questions around the processes and experiences of learning economics, and the sources and nature of difficulty encountered by students,

[1] I use the terms "teacher" and "lecturer" interchangeably. Although in South Africa "teacher" usually denotes a school teacher while "lecturer" is used for a "teacher" in higher education, I believe that "teacher" signals a more nuanced teaching/learning role that accords with my own perceptions and experiences.

remain largely unexplored; consequently, teachers' knowledge of how to support or facilitate learning is limited.

In a higher education landscape characterized by rapid change and enduring inequality, and against a backdrop of growing disillusion with the discipline as it has been practised (and taught), teachers of economics at university face intensifying challenges, which traditional approaches to pedagogy and curriculum seem increasingly less fit to address. There is clearly a need to deepen understanding of students' learning, and explore potential ways in which it may be more effectively supported and facilitated, in undergraduate economics in the South African context. Unanswered questions which emerge are broader than the focus of the existing body of quantitative research: contemplating the experiences and processes of students' learning, and the sources of difficulty they encounter, implies a holistic and deep exploration of learning. Difficulty in itself has strong connotations of personal experiences and affective responses which are not accounted for in the predominant quantitative approach, and seem to require a more encompassing framing that can account for individual learners and their personal context in interaction with the discipline.

Such a perspective on learning is inherent in the body of scholarship that has become known as the Threshold Concepts Framework (TCF) (Land, Meyer & Flanagan, 2016). This view of learning emerged in economics education research, and has since become widely influential (Flanagan, 2016; Tight, 2014). In this view, certain disciplinary concepts may be designated as 'threshold concepts' (Meyer & Land, 2003) — educationally critical ideas that must be mastered if a learner is to progress in disciplinary ways of thinking. The troublesome and transformative nature of encounters with disciplinary threshold concepts means that affective aspects of learning are entwined with cognitive ones; disciplinary learning cannot be conceived of separately from the learner or her personal context (Cousin, 2006). The TCF thus offered an appropriate framing for a holistic, qualitative, contextualized understanding of economics students' learning that could accommodate and illuminate the questions I wished to pursue. In order to explore economics students' learning at close range, I developed a tutorial programme informed by a threshold concepts (TC) orientation (Davies & Mangan, 2006c, 2008), which ran alongside mainstream large-class lectures

in a second year[2], Intermediate Microeconomics course. The twenty participants in this TC-infused programme subsequently took part in further data generation and analysis, giving effect to the qualitative, interpretive approach I sought to take in this research.

In the following sections of this chapter, I provide some background on disciplinary understandings of learning. I then sketch the South African higher education context, and consider existing research in economics higher education in this country. Thereafter I return to the rationale for this study, introduce the research questions and describe the research design used, before outlining the organization of the chapters that follow.

1.2 'Thinking like an economist': Learning in economics

The notion that students should show the ability to "think like an economist" (a phrase commonly attributed to Siegfried et al., 1991) recurs in the international economics education literature as the central objective of teaching and learning in the discipline, and is shorthand for saying that students should have internalized the key concepts, principles and tools of economic analysis, and know when to apply them appropriately to new situations (Becker, 2001). The characterization of economics as a way of thinking aligns with views originating in the ideas of Piaget and later works by Bruner, which hold that understanding a discipline requires understanding its structure — the basic concepts and principles that are used to impose meaning and order on the world (Entwistle, 2005; Thomas, 1987).

Economic knowledge can be specified in terms of a conceptual core and characteristic methodology (Colander, 2004; Entwistle, 2005). While consensus may not exist on the precise list of concepts and principles that might form the definitive core of economics, mainstream economists agree on the common essential elements of scarcity and unlimited wants from which the rest of economics derives (Saunders, 2012; Thomas, 1987). The ensuing approach is elaborated by Siegfried et al. (1991, p. 21):

> Thinking like an economist involves using chains of deductive reasoning in conjunction with simplified models (such as supply and demand,

[2] I use the terms "intermediate" and "level 2" interchangeably to refer to second-year economics courses; likewise, "introductory", "principles" and "level 1" refer to students' first year of economics study.

> benefit-cost analysis, and comparative advantage) to illuminate economic phenomena …, identifying and evaluating trade-offs in the context of constraints, distinguishing positive from normative analysis, and tracing behavioural implications of change while abstracting from aspects of reality. It … involves describing redistributive implications of change, amassing data to evaluate economic events, and testing hypotheses about how consumers and producers make choices and how the economy works. Finally, thinking like an economist involves examining many problems through the filter of efficiency — coping with limited resources.

In the much-cited words of Keynes, economics may thus be described as "a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps the possessor to draw correct conclusions" (Keynes, 1922, cited in Goldsmith & Casey, 2012, p. 234). This approach to analyzing choice behaviour still encapsulates the "ways of thinking and practising" (WTP) in economics (Entwistle, 2005) — a common purpose, methodology and perspective that define the "disciplinary 'tribe' or community of practice" (Reimann, Land & Meyer, 2005, p. 31). These widely accepted norms are evident today in globally similar content and pedagogy in economics education — a deductive, 'theory-first', lecture-based approach, particularly in introductory and intermediate courses (Reimann et al., 2005).

While noting that the content of economics curricula is contested, this study does not set out to trouble the discipline: it starts from the existing curriculum, which (in the case study module, and in comparable undergraduate courses around the world) is based in mainstream, neoclassical thought. The defining principles, conceptual skills and ways of thinking just described must be mastered if students are to become proficient participants in the discipline. Notwithstanding the critiques of the curricular focus on neoclassical orthodoxy (considered further in Chapter 2), the principles and practices characterizing the discipline as defined here would find wide agreement among economists; after all, there is a need to master the fundamental tenets before one can contest them or move on to alternative or critical views.

For students, learning economics can thus be viewed as requiring a mastery of essential concepts and techniques that is associated with developing a new way of thinking, as they move through introductory and intermediate modules (Hansen, 2009; Siegfried,

2009). Students often experience this progression or transformation as a difficult process, and many struggle to develop economic understanding and acquire the necessary WTP. While this difficulty is widely acknowledged in economics education research, its sources, and the processes by which students reach conceptual mastery, are not as well understood or agreed upon (Becker, 2004; Davies & Mangan, 2008; Dynan & Cate, 2012; Frank, 2005; Green, Bean & Peterson, 2013; Wilson & Dixon, 2009). The shared understanding among economics educators that disciplinary learning requires mastery of particular transformative and troublesome ideas has been formalized and elaborated in the theory of threshold concepts (Meyer & Land, 2003), which (as noted above) frames this study, and is discussed more fully in Chapter 3. In this view, disciplinary features interact with individual and contextual aspects in affecting the course of learning. The following section describes the South African higher education context and the challenges it presents.

1.3 Features and challenges of the South African higher education context

The higher education[3] landscape in this country has changed dramatically since the advent of constitutional democracy in 1994. The past two decades have seen the integration and overhaul of a fragmented and racially discriminatory system into a single national system comprising a mix of institutions with different missions: eleven traditional (research) universities offering degree programmes, six comprehensive universities, and six vocationally oriented universities of technology (Waghid, 2015). The country is in the throes of expanding access to university study (Teferra, 2015); enrolment at public universities has doubled since 1994 to reach almost a million students, and student demographics have changed dramatically with an increase in access for black[4] students (CHE, 2016). Despite significant advances, higher education is still marked by profound inequality across and within universities. Historically black

[3] The term "higher education" in South Africa usually refers to all post-school qualifications across traditional and comprehensive universities and universities of technology. In this thesis, however, I use the term mostly to refer to degree offerings at traditional universities.

[4] In contemporary South Africa, four main race categories – African, coloured, Indian and white – prevail, for purposes of redress in resources and in law. Consistent with the terminology used by the CHE (2010), the term "black" here denotes all population groups other than white — i.e. South Africans who identify as African, coloured and Indian.

institutions remain underdeveloped (Waghid, 2015); overall participation rates are still much lower for black than for white students, and success rates are skewed by race and prior education (CHE, 2016). Across the sector, academic staff numbers have not kept pace with the growth in enrolments, and student to staff ratios have worsened considerably (CHE, 2016). Moreover, the past few years have seen an escalation in disruptive and costly student protests — linked primarily to funding, but increasingly including broader political issues around institutional and curricular transformation — which are likely to intensify (CHE, 2016).

Growth in student numbers in South Africa mirrors the global massification of higher education since the 1990s, which has brought about greater diversity in the student body and increasing enrolment of non-traditional students from historically disadvantaged backgrounds. Given South Africa's history of racial discrimination, the commitment to address inequalities and fight discrimination strongly frames this trend, with moral imperatives upholding justice and equality (Cross & Carpentier, 2009). Increasing enrolments and wider diversity have been accompanied by concerns about throughput rates (Scott, Yeld & Hendry, 2007), and within the broader issue of social justice, have given rise to debates around epistemological access (CHE, 2010), or "learning how to become a successful participant in an academic practice" (Morrow, 2009, p. 78).

Students entering university in South Africa today "do so from positions of extreme inequality, most obviously in schooling, but also in terms of financial and other resources" (CHE, 2010). A lack of academic "preparedness" is cited as one of the reasons why students fail, or take longer than the regulation time to complete their degrees (Scott et al., 2007). Underpreparedness in the South African context may be characterized as a "distinct systemic phenomenon", attributable to this country's "enduring unequal schooling system [which] creates multiple layers of disadvantage" (Bradbury & Miller, 2011, p. 1). It results in an "articulation gap" between secondary and tertiary education: students from educationally disadvantaged backgrounds "have generally not been exposed to key academic approaches and experiences that are taken for granted in traditional higher education programmes" (Scott et al., 2007, p. 42). Gaps in key academic literacies are compounded if students struggle to grasp 'rules' about how the university learning environment works — both explicit rules (structures of authority, formal contact arrangements, course outlines) and implicit principles that

underlie discipline specializations, such as evaluation criteria and expectations of academic text (Cross, Shalem, Backhouse & Adam, 2009). Negotiating the transition to university study thus makes particularly intense demands on the academic and social resources of students from educationally disadvantaged backgrounds (Cross et al., 2009).

Three specific and interrelated aspects of academic underpreparedness that are particularly relevant to students' learning in the discipline of economics centre on their numerical skills, their accustomed approaches to learning, and issues of language — each elaborated briefly below.

Quantitative literacy (or numeracy) is recognized as critical for epistemological access to a range of disciplinary practices, yet many students in South Africa are poorly prepared to meet the quantitative requirements of academic disciplines (Frith & Lloyd, 2013). Economics as currently taught is strongly quantitatively oriented, and mathematical ability is an important determinant of student success (Bokana & Tewari, 2014; Parker, 2006). Gaps in students' quantitative skills as they emerge from the schooling system may thus significantly constrain their access to and progression in the discipline.

The metaphor of "deep" and "surface" approaches to learning (Marton & Säljö, 1976; Ramsden, 1992) distinguishes between students who take an "understanding" and those who take a "reproduction" approach to learning. The rote-learning approach is still typical of much schooling in South Africa, and many students continue to apply this "knowledge reproduction" approach, which has served them well at school, rather than the "knowledge construction" required at university level (Bradbury & Miller, 2011). In undergraduate economics, many students seem to rely on rote-learnt responses and the memorization of algorithmic techniques of the discipline. This may allow them to solve narrowly specified problems, but does not imply a deep understanding of the theory, or the ability to transfer either techniques or theory to other contexts, such as real-world applications or subsequent courses. Some of the problems in economics teaching and learning in our context can thus be characterized in terms of the predominance of surface learning approaches, and the need to find ways of promoting deep learning instead.

Mastery of English as a medium of instruction is a significant obstacle to university success for many students, imposing a double workload or a barrier to conceptual access on those pursuing higher education in a language that is not their mother tongue (Cross et al., 2009). A related issue centres on the specific language or discourse of disciplines, and its role in structuring and communicating disciplinary knowledge (including tacit knowledge that informs the social practices of the disciplinary community) (Jacobs, 2007). Students need to be inducted into the discourse of economics so that they become fluent in the use of its constructs; indeed, content knowledge is often conflated with mastery of the academic discourse (Snowball & Boughey, 2012). Again, the challenge of mastering disciplinary discourse will be intensified for students who lack mother-tongue proficiency in English and have emerged from school academically underprepared for university study.

While not an exhaustive list, it seems clear that these factors are significant contributors to challenges in undergraduate economics teaching and learning in South Africa, including high dropout and failure rates, relatively low numbers of majors and postgraduates, and concerns that students who pass introductory and intermediate modules have not always attained the expected competencies and may be unable to transfer or apply their knowledge. The following section briefly reviews the existing research on economics students' learning in this country.

1.4 Learning in undergraduate economics in South Africa

Research into economics students' learning in South Africa has been largely quantitatively oriented, using education production functions to identify determinants of success (or performance), which are summarized here. Prior academic attainment as reflected in matriculation (school-leaving exam) results — in aggregate, and particularly in students' Mathematics and English marks — has been found to impact significantly on their performance in economics (Bokana & Tewari, 2014; Horn, Jansen & Yu, 2011; Parker, 2006). Having English as a home language is indicated as a further significant success factor (Bokana & Tewari, 2014; Parker, 2006; Snowball & Boughey, 2012), while evidence regarding age, race and gender impacts is less conclusive (Bokana & Tewari, 2014; Parker, 2006; Van der Merwe, 2006). Student behaviour and motivation

(as measured by lecture attendance or time spent on academic activity) have been found to affect performance positively (Horn et al., 2011; Van der Merwe, 2006; Van Walbeek, 2004), as have a variety of educational interventions such as supplementary tutorials or technology-based innovations (Horn & Jansen, 2009; Horn et al., 2011; Smith & Ranchod, 2012; Van der Merwe, 2007).

The empirical findings from this line of enquiry are largely internally consistent, intuitively sensible, and congruent with international findings (Owen, 2012). Nonetheless, they contribute a relatively small piece to the puzzle of understanding students' learning: Bokana and Tewari (2014) have cautioned, in their recent and extensive econometric analysis of success factors in economics and accounting in a South African university, that all the predictors they identify as significant still account for only a very small proportion of the entire variance in student success. This suggests a need for further — and arguably broader — investigation, to reach a more holistic understanding of economic students' learning.

Emergent qualitative insights from the pilot phase of research in first-year economics at a traditional university in South Africa point to the same concerns around students' learning and conceptual understanding reflected in international economics education research, and suggest these might be compounded in South Africa by the challenges of weak mathematical abilities and studying in English as an additional language (Ojo, 2012). Beyond this work, our understanding of the qualitative dimensions of students' learning in this country remains limited and superficial.

In this study, I therefore set out to deepen understanding of the experiences and processes of economics students' learning, using a case study design and a qualitative, interpretive research approach intended to elicit rich, descriptive insights from the students' perspective. The next section presents the research design and guiding questions, introduces the study site and my position within the research, and outlines the ways in which the study may contribute to knowledge.

1.5 Research design, vantage point and contribution

This is a qualitative, interpretive study which used a case study research design, set in the TC-infused tutorial programme which ran alongside the mainstream, second-year microeconomics course on the Pietermaritzburg campus of the University of KwaZulu-Natal (UKZN) in the second semester of 2014. Twenty students — volunteers from the mainstream class — participated in the tutorial programme and the related data-generation processes. I used Interactive Qualitative Analysis (IQA) (Northcutt & McCoy, 2004) to generate and analyze data, in focus group sessions and in-depth individual interviews; these were supplemented by participants' reflections on their learning, written over the course of the semester.

The overarching objective of this study was to explore students' learning in undergraduate economics. The research questions that guided my study were:

- How do economics students learn in a threshold concepts-infused higher education learning programme?
- Why do students learn in this programme in the ways that they do?

UKZN is one of the eleven traditional, research-led universities in South Africa, where I have taught economics for many years; the institution is described in more detail in Chapter 4. Pertinent here is that the content of economics curricula and the logistics of teaching at UKZN (as at the other traditional South African universities) are very similar to those in most 'Western' universities: first- and second-year economics comprises core courses in micro- and macroeconomics, taught predominantly through large-class plenary lectures, supplemented with tutorials or workshops[5] focused on exercises and problem sets (Luiz, 2009). These similarities meant that I could draw useful inferences from existing international scholarship on teaching and learning in undergraduate economics, and likewise that the findings of this study — though specific to the case — may have broader resonance.

The second-year microeconomics course in which I set this study (Econ 202) is one I have taught for several years, which has afforded me some insights into students' learning. Despite having reached their second year of economics study, many students

[5] The term used at UKZN for additional scheduled sessions in which students work through written exercises and their solutions, assisted by postgraduate tutors.

appear to find learning and applying disciplinary concepts and techniques extremely challenging. It seemed important to understand more about how students learn in the discipline, why they struggle, and where they are likely to become stuck — and to reach this understanding of the processes and experiences of their learning through the views of the students themselves. Having found that the perspective of the TCF aligned with my observations of students' experiences of learning, I set up a tutorial programme informed by principles inherent in the framework, using a series of teaching and learning activities that embedded microeconomic threshold concepts (Davies & Mangan, 2006c). This programme could be characterized as an "arranged situation" (Naidoo & Vithal, 2014); it served as a greenhouse within which I could use active, cooperative pedagogical approaches empirically established as conducive to learning, but not feasible within the mainstream lectured course. The programme allowed me to observe the participants' learning under these enhanced conditions at close range, and afforded me access to their own perspectives on their learning.

My position within the research entailed multiple roles. I was the lecturer of the mainstream, semester-long module, and also responsible for its assessment on the local campus[6]. I was the tutor in the programme which I developed, in which I engaged with students in a much more informal way, facilitating group discussion rather than teaching. As the researcher undertaking this study, I was a key research instrument (Creswell, 2013), and in many respects an insider — invested in and central to the study, and shaping and influencing both the learning process and the investigation thereof. I was aware of the inevitable power imbalances between the participants and me, and sought to mitigate their impact on both the tutorial programme, and the processes of data generation.

As a qualitative, interpretive researcher I set out to understand the multiple realities at play, informed by a social constructivist approach in both research, and teaching and learning. The pedagogical approach in the tutorials reflected constructivist principles in its active, cooperative emphasis, and was infused with a TC orientation inherent in the activities that structured students' interactions in the tutorials (Davies & Mangan, 2006c). My research methodology used IQA, an approach in which participants generate and — crucially — are empowered to analyze and interpret data, to construct

[6] The Econ 202 module is taught across two separate campuses, and is centrally coordinated, with a common curriculum and synchronous assessments.

their view of reality as a group. This group reality is subsequently elaborated on at individual level, providing rich and varied perspectives.

The study findings offer insights into the experiences and processes of students' learning in economics, drawn from rich, contextualized, qualitative description based on participants' own construals of their learning in the TC-infused tutorial programme. The research addresses both conceptual and methodological gaps in South Africa, where economics higher education scholarship is dominated by quantitative investigations of performance, qualitative methodological orientations are rare, and most of our research-informed understanding of learning has been based on international accounts, related from the perspectives of academics and educational researchers.

Threshold concepts theory has become established as an influential and generative framework for research across a range of disciplines in the UK, Australasia and USA (Entwistle, 2008; Flanagan, 2016; Peter & Harlow, 2014; Tight, 2014). However, its application in South Africa and other developing countries remains minimal. While the discipline of economics has been the subject of many TC-oriented studies, none have been located in South Africa. The study findings thus contribute to a contextual gap in TC scholarship. The foregrounding of undergraduate students' voices, which have thus far been relatively underrepresented in TC discourse (Felten, 2016), offers additional perspectives that may deepen the understanding of learning beyond the study context.

The combination of the TCF and IQA enabled me to sketch some possible answers to questions not usually asked in economics education research (and to date, neglected in South African contributions to this area), about the processes and experiences of students' learning in economics, and to draw some inferences for enhancing the conditions of that learning. These insights may be relevant to economics educators and to researchers using the TC or related orientations, and ultimately, through pedagogical and curricular responses, of benefit to economics students.

1.6 Organization of the study

This chapter has introduced the study, offering some detail on the background, rationale and focus which guided it.

Chapter 2 reviews the terrain of existing international scholarship around teaching and learning in economics. I consider three interlaced strands of research — learning concerns and teaching techniques, curriculum and content issues, and student learning perspectives — and offer a synopsis from extant literature of likely sources of disciplinary difficulty.

Chapter 3 presents the threshold concepts view of learning that frames the study, traces its theoretical lineage, considers critiques, reviews its application in economics, and reflects on where this study may contribute to scholarship, within the framework and in relation to broader economics education research.

Chapter 4 describes the research methodology I used to seek answers to my research questions. After sketching the case study in more detail, I describe the rationale and realization of the TC-infused tutorial programme and explain the use of IQA to generate and analyze data. Considerations of rigour and ethics are followed by some reflections on the methodology.

Chapter 5 details the application of IQA in the focus group sessions, and presents the group's understanding of their learning in the tutorial programme. The affinities (or themes) the participants identified as comprising their learning are introduced, and their interrelationships depicted in a Systems Influence Diagram (SID) — a mindmap derived according to IQA protocol, depicting the group's construal of their learning.

Chapters 6, 7 and 8 elaborate these affinities, relying largely on the participants' own words to describe their construals of each affinity, and the relations of influence among them. These three data-description chapters are bracketed by a common introductory interleaf (preceding Chapter 6), and synthesis (following Chapter 8).

Chapter 9 abstracts ten key findings from the affinity descriptions of the previous three chapters, discussing each in relation to existing scholarship — both within the TCF, and in broader economics education research.

Chapter 10 provides an overview of the study, notes some limitations, and draws out implications for practice and further research, before offering a tentative model grounded in the study findings, and some concluding reflections.

CHAPTER 2
LITERATURE REVIEW: RESEARCH IN ECONOMICS HIGHER EDUCATION

2.1 Introduction

The first chapter outlined the context for this study, highlighting global concerns around students' learning of economics. These concerns aligned with the findings of the limited body of South African research, and my own observations and unanswered questions regarding the difficulties encountered by economics students, to form the motivation for this study. As Chapter 3 will elaborate, drawing on threshold concepts theory to frame the study suggests a perspective on disciplinary learning that has implications for teaching and curriculum choices. Because TCs serve to transform and integrate students' understanding, their sphere of influence is disciplinary learning as the whole. For that reason, this chapter takes a wide-angle view of research into teaching and learning in economics. It offers a broad sketch of the most relevant features of the terrain of economics education research in recent decades, to serve as a backdrop to a deeper investigation of the questions around students' learning raised in Chapter 1. Informing this review is the discussion (also in Chapter 1) of the defining principles of the discipline and the conceptual skills that an economist should master, reflected in the frequently cited teaching objective of enabling students to develop the ability to "think like an economist".

The current span of research into economics education can be seen as comprising three entwined strands, with discernible geographic variations in emphasis. These are considered in section 2.2. The first strand is well represented internationally and dominates research in the USA and South Africa; it focuses on teaching inputs and learning outputs, and includes quantitative studies that identify the determinants of performance as well as evaluations of teaching approaches and guidance for innovation in teaching. The second strand groups two sets of critiques regarding undergraduate economics curricula and is also in evidence globally, but is barely represented in South Africa. A third strand of research taking a student learning perspective is found mainly in the UK, Europe and Australasia. This approach draws on educational psychology and

examines the processes of learning — a focus which is absent from South African economics education research. It was largely from this strand that the threshold concepts view of learning and associated theoretical framework emerged[7]. Because sources of difficulty or 'troublesome knowledge' are central to the idea of threshold concepts, section 2.2 includes an overview from the economics education literature of features of the discipline itself that might present difficulty to students. Section 2.3 concludes the chapter, preparing the ground for the elucidation of the TCF in Chapter 3.

2.2 Research around teaching and learning in economics

The international literature on economics education spans a wide range of topics and approaches, and its contributors include both traditional academic economists drawing on their experience and understanding of teaching (such as Becker, Siegfried, Colander, and Frank), and more specialized educational theorists who have focused on learning in undergraduate economics (including Meyer and Land, Cousin, and Entwistle) (Ojo, 2012). Impact analysis of the most cited articles in economics education journals since 1990 (Mixon & Upadhyaya, 2011) reveals that quantitative research aimed at identifying key factors affecting student performance is an important line of enquiry. There are also rich qualitative, normative and philosophical debates around the content that is (or ought to be) taught, and around teaching methods and interventions. These questions around what and how economics is taught are strongly linked to concerns about the quality of learning in the discipline, and are more pertinent for this study. Most attention seems to fall on principles (introductory) modules, and the economics major, with less research conducted specifically at intermediate levels (such as the second-year Intermediate Microeconomics[8] module which is the case study for this investigation). Nonetheless, the issues around pedagogy, content and learning arguably apply to some extent across all undergraduate economics courses.

[7] For the purposes of this study, the TCF can be seen as drawing on and subsuming the most relevant or generative elements from this approach, and since the TCF will be considered in more depth in Chapter 3, the review of the third strand is relatively brief.

[8] The intended outcomes of Intermediate Microeconomics are noted in Chapter 4. At UKZN, no distinction is made in course content at first- and second-year level between students who plan to major in economics and those who are taking these modules as degree prerequisites or electives.

In the discussion that follows, I have grouped the broad themes evident in the literature into three strands: teaching inputs and learning outputs, content and curriculum concerns, and student learning perspectives. In reality, these three strands of research are closely (and sometimes messily) plaited together, with many areas of overlap and mutual influence that resist simple categorization.

2.2.1 'Inputs' and 'outputs': Teaching techniques and learning concerns in economics

The first strand of research encompasses teaching and other 'inputs', and the resultant learning 'outputs'. Studies based on quantitative modelling of determinants of performance are a significant component. While not reviewed in detail here, some key findings of this body of work are noted as they feed into the relevant issues highlighted. A related approach within this strand foregrounds learning outcomes and the description of specific teaching techniques to improve learning.

2.2.1.1 Prevailing pedagogy

As noted in Chapter 1, undergraduate economics education has long reflected wide agreement on concepts, curricula and teaching approaches. This uniform approach is evident in the UK, USA, Australasia and South Africa (Duhs & Guest, 2012; Frank, 2012; Ojo, 2012; Reimann et al., 2005). It can be traced in part to the philosophical dominance of neoclassical orthodoxy, which generates standard first- and second-year curricula that tend to be full and content-driven — a trend reinforced by the widespread adoption of "homogenized" textbooks (Grimes, 2009, p. 95; Reimann et al., 2005). Standard curricula in turn appear to favour the uniform and largely passive (from the students' perspective) approach typical of introductory and intermediate economics teaching the world over: large-class, fast-paced, 'chalk and talk' lecture delivery, supplemented by structured tutorials centred on worked examples or problem sets (Becker & Watts, 1998; Davies & Mangan, 2008; Goffe & Kauper, 2014; Reimann, 2004). Assessment is similarly uniform, with extensive use of multiple choice and short answer questions (Reimann et al., 2005), particularly at introductory levels. Critiques

notwithstanding, it seems that "strong consensus … exists among economists on what should be taught and the way this should be done" (Reimann et al., 2005, p. 31).

While this approach to teaching could be deemed a signature pedagogy for economics (Shulman, 2005), it has also been critiqued as a pedagogy of expedience (Maier, McGoldrick & Simpkins, 2012). The influential review of the economics major in the USA twenty-five years ago (Siegfried et al., 1991) identified several problems that still recur in the international literature: the challenges of teaching large classes; reliance on lecturing and passive learning; and heavy use of textbooks and problem sets instead of encouraging wider reading and writing by students. Despite continuous critique from within the discipline of the reliance on traditional lecture modes (see for example Becker, 2004; Becker & Watts, 1998; Salemi, 2002), these problems persist (Colander & McGoldrick, 2009).

A significant shortcoming of a lecture-based approach is that the rapid pace of delivery is likely to impede some students' learning and mastery of content (Frank, 2012; Reimann et al., 2005). Moreover, the dominance of "lecture-based, test-assessed" pedagogy "may communicate to students that the discipline holds uncontroversial, knowable, single right answers" (Bloemhof, 2012, 60), which is in turn likely to encourage surface learning approaches such as memorization, instead of fostering genuine understanding, deep approaches to learning and critical thinking (Simkins & Maier, 2009). There is evidence of slow growth in the use of alternative teaching methods to the standard lecture format, notably classroom discussions, computer visual displays (e.g. Powerpoint[9]), prepared sets of notes, lab assignments (in econometrics), references to the popular press and contemporary culture, and classroom experiments (Miller & Rebelein, 2012; Watts & Becker, 2008). Nonetheless, lecturing remains by far the dominant mode at first- and second-year level (Goffe & Kauper, 2014), despite mounting evidence that more active learning approaches lead to deeper understanding, better performance and longer retention of learnt material (Goffe & Kauper, 2014; Miller & Rebelein, 2012; Ramsden, 2003).

[9] The extent to which Powerpoint use could be considered an alternative teaching method that departs from 'chalk and talk' in any meaningful way is questionable.

2.2.1.2 Concerns about the quality of learning

The endurance of this pedagogical approach may be one contributing factor to disappointing learning outcomes (Hansen, 2009; Reimann et al., 2005). Teachers of university economics frequently bemoan students' "lack of basic knowledge and skills …, the narrow focus on course grades rather than a deeper understanding of the subject, the difficulty students experience in retaining for any appreciable time what they learned, and the relatively small increase in the knowledge of economics displayed by college seniors who studied economics" (Hansen, 2009, p. 107). The "expected proficiencies" approach proposed by Hansen (1986, 2001, 2009, 2012) expands on the knowledge and skills required of economics graduates, and has become a widely known standard of intended outcomes of economics courses (Adkins & Newsome, 2006; Saunders, 2012). In a cognitive hierarchy based on Bloom's taxonomy (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956), this entails being able to access, display command of, and interpret existing knowledge; interpret and manipulate data; apply existing knowledge; and create new knowledge. These proficiencies can be used to guide the objectives, structure and pedagogy of individual and sequenced economics courses. Nonetheless, the extent to which they have been applied or have enhanced learning outcomes in practice is questioned (Hansen, 2009).

A major theme in the economics higher education literature over the past two decades concerns the quality of learning in undergraduate courses, particularly with regard to conceptual understanding and the intended transformation in students' ways of thinking described in Chapter 1 (Dubas & Toledo, 2016; McGoldrick & Garnett, 2013). Thus "most students seem to emerge from introductory economics courses without having learned even the most important basic principles" (Frank, 2005, p. 1). At the intermediate level too, many students seem to rely on surface approaches to learning (discussed further in section 2.3.3), such as rote learning and the mechanical application of algorithmic rules, with varying degrees of success. This approach may allow students to pass exams, but often without deep understanding or integrated knowledge of the core principles and concepts that comprise the discipline of economics (Green et al., 2013)[10]. Once they reach economics courses that emphasize Bloom's (Bloom et al.,

[10] This is not a recent concern; it is disclosed by Dahlgren (1978, cited in Ramsden, 2003, p. 72) as follows: "If a more thorough understanding is required in order to answer a question [about phenomena such as price determination and equilibrium], the number of acceptable answers is very low … In many

1956) or Hansen's (2001) higher order learning objectives — (complex) application, analysis, synthesis and evaluation — students struggle because they lack the requisite skill set for higher order learning (Dynan & Cate, 2009). Moreover, in everyday life outside the classroom context, they are unable to deploy the concepts that they have acquired "in a coherent way to make sense of the economic phenomena they experience" (Davies & Mangan, 2006a: 2). For such knowledge transfer to occur, students have to process course concepts at a deep level rather than merely at surface level. Failure of transfer may be ascribed not only to a lack of discipline-specific conceptual knowledge, but also to a lack of procedural knowledge or "schemata" — the integrating frameworks used by experienced professionals in the discipline to address new problems (Green et al., 2013), or in other words, to "think like an economist".

Comparable South African research focusing on the quality of learning in economics is scarce, though it appears that similar issues may beset university economics here. The challenging or difficult reputation of the discipline, as experienced globally, is reflected in South Africa in the generally poor academic performance, low numbers of economics majors, low throughput, and high repeat rates in undergraduate economics in universities across the country (Bokana & Tewari, 2014; Horn & Jansen, 2009; Parker, 2006; Smith & Ranchod 2012; Snowball & Boughey 2012).

The main response within economics higher education scholarship in this country to the 'problematic' nature of the subject has taken the form of quantitative investigations. Several studies over the past decade have used variants of an education production function approach to examine the impacts on performance of three groups of factors:

- students' pre-existing characteristics and prior academic attainment (e.g. Bokana & Tewari, 2014; Horn & Jansen, 2009; Horn et al., 2011; Parker, 2006; Snowball & Boughey, 2012);
- students' behaviour and motivation (e.g. Parker, 2006; Van der Merwe, 2007); and/or

cases, it appeared that only a minority of students had apprehended basic concepts in the way intended by teachers and textbook authors. Complex procedures seem to be solved by the application of memorized algorithmic procedures … In order to cope with overwhelming curricula, the students probably have to abandon their ambitions to understand what they read about and instead direct efforts towards passing examinations … which reflect the view that knowledge is a quantity."

- educational interventions undertaken by academics (Horn & Jansen, 2009; Horn et al., 2011; Smith & Ranchod, 2012; Van der Merwe, 2007).

This work has contributed to an internally consistent knowledge base of the determinants of students' performance in university economics in South Africa. However, it remains narrowly focused in terms of both the scope of investigation undertaken, and the positivist approach and quantitative methodology it favours. Some qualitative insights from research in first-year economics at one of the eleven traditional universities in South Africa (Ojo, 2012) point to the same concerns noted in the international literature: lecturers find that students are unable to connect economic concepts, make progression in conceptual understanding, or apply the concepts in real life; while students state that they struggle to relate the concepts to the South African context. These difficulties are compounded by the challenges of weak mathematical abilities, studying in English as an additional language, large classes, and lecturers' overreliance on textbooks (Ojo, 2012).

2.2.1.3 Innovative pedagogical approaches

In response to concerns about the quality of learning, a body of international research exploring ways of enhancing teaching by engaging students more deeply with the subject matter has grown rapidly since the 1980s (Becker & Watts, 1998; Salemi & Walstad, 2010). Much of this work is rooted in educational theory and reflects constructivist views, emphasizing tasks that cast learners in an active role and often entail social processes and the creation or discovery of understanding (Miller & Rebelein, 2012; Perkins, 2006). This line of research reflects — and advocates the intensification of — the shifts in teaching described above (Watts & Becker, 2008), exploring a range of specific teaching and learning strategies such as cooperative learning, classroom experiments or games, ICT-based innovations (including electronic response systems, online discussions, and quizzes), and writing. Many studies offer descriptive or instructive accounts of alternative teaching techniques, and some include empirical support for the effectiveness of these innovations based on an assessment of learning (Baumol, 1998; and see the collections in Becker & Watts (1998), Salemi & Walstad (2010) and Hoyt & McGoldrick (2012)). While a full review of these

alternatives is not feasible here, the synthesis below highlights key aspects of techniques which share features with the approach taken in my case study tutorial group.

Cooperative learning has been intensely researched in higher education literature in general. Small group, problem-solving learning has been found to promote understanding, achievement, reasoning, innovation and transfer of knowledge (McGoldrick, 2012; McGoldrick, Rebelein, Rhoads & Stockly, 2010), possibly because it fosters deep rather than surface approaches to learning (Marburger, 2005). Cooperative learning is also linked to greater student engagement, motivation, enjoyment of the subject, self-esteem, and retention than lecture-based teaching (McGoldrick, 2012). Within economics education research, there is recognition that the benefits of small-group learning (including students' exposure to variety in learning styles, deeper understanding, and peer interaction) are likely to outweigh the costs (Salemi, 2002). Likewise, students themselves have been found to appreciate the social, learning, and career skills-related benefits of collaborative learning (Gleeson, 2006). Much of the literature on cooperative learning in economics provides descriptions and examples to guide implementation, while less attention has been paid to measuring or explaining the impact of this approach on learning (McGoldrick, 2012; Miller & Rebelein, 2012). Although a recent study attempting to isolate the impact of collaboration (from that of problem-solving) found that collaboration in itself had no impact on students' performance, interest or course perceptions (Emerson, English & McGoldrick, 2016), most of the empirical evidence points to the effectiveness of collaborative learning in economics in the form of improved academic performance, particularly on questions requiring critical analysis or application (Duke & Awokuse, 2009; Marburger, 2005; Miller & Rebelein, 2012; Yamarik, 2007). However, understanding of the means by which collaborative work may enhance learning in economics remains speculative, and has been highlighted as a question deserving further investigation (Yamarik, 2007).

Structured classroom discussion is another alternative approach in economics teaching (Watts & Becker, 2008). Discussion offers a powerful way of resolving students' confusion and facilitating deeper content understanding. As a form of "two-way talk" between instructor and students, discussion compels students to learn actively, apply learnt concepts, deploy higher order thinking, and appreciate the relevance of

economics (Hansen & Salemi, 2012). Limited economics-specific empirical and anecdotal evidence indicates that discussion can deepen understanding and promote higher order mastery, while enhancing student enjoyment and interest (once they become accustomed to it and possible initial resistance is overcome) (Salemi, Madden, O'Sullivan & Joshi, 2010).

Writing is another tool to help students grasp difficult content, make connections between concepts, articulate and apply their knowledge, and develop critical thinking skills (Crowe & Youga, 1986; Frank, 2006; Hansen, 1993, 1998; Perry-Sizemore & Greenlaw, 2012). In line with the idea of writing-to-learn (Emig, 1977), "the purpose of using writing to teach economics is not primarily to make students better writers, but rather to give students a tool to learn economics better" (Greenlaw, 2003, p. 61). Evidence from undergraduate economics modules indicates that writing enhances academic performance, specifically regarding comprehension and application of knowledge (Dynan & Cate, 2009; Greenlaw, 2003; Green et al., 2013). Structured and/or scaffolded writing assignments can help students to move from surface learning approaches and mechanistic application of algorithms towards independent tackling of much 'messier' unstructured problems, which require sound understanding and integrated knowledge (Green et al., 2013). Less formal writing such as reflection papers or journals may be used to develop students' appreciation of the relevance of economics to their daily lives (Brewer & Josefowicz, 2006).

Writing is often linked to innovations which aim to increase the perceived relevance of economics to students by emphasizing the application of economic principles to real-world, everyday issues and personal contexts (Brewer & Josefowicz, 2006; Davies & Mangan, 2006a; Frank, 2006). Case use involves presenting students with source material drawn from real experience, and placing them in a decision-making, analytical role (Conway, 2012). This technique draws on the learning benefits of real-world problem-solving, personal relevance, discussion and debate; it provides formative learning opportunities which promote higher order mastery, and is found to increase student motivation. Similar benefits of application and conceptual learning may be derived from requiring students to analyze "context-rich problems" (Bangs, 2012), as well as examples drawn from less obvious fields, including sports and literature (Becker & Watts, 2008; Hoyt & McGoldrick, 2012). These innovations are frequently tied to

greater use of alternative types of written work which also encourages more "robust processing" and transfer of course concepts (Green et al., 2013, p. 142).

Classroom experiments and games offer additional ways to illustrate concepts, engage students more fully, and facilitate their understanding of economic principles (Emerson & Hazlett, 2012). By requiring that students make economic decisions in controlled environments, experiments allow students to discover important concepts for themselves. Concrete experience can make economic tools easier to understand and use, "bringing these abstract concepts to life" (Hazlett, Paulson Gjerde, Vazquez-Cognet & Smrha, 2010, p. 95). This in turn promotes greater ownership and potentially longer retention of new knowledge (Emerson & Hazlett, 2012). Several empirical studies since the 1990s find that use of classroom games has a significant positive effect on academic achievement (Emerson & Hazlett, 2012; Miller & Rebelein, 2012), while formal and anecdotal evidence also suggests that experiments increase students' interest in and enjoyment of the course, and their perceptions of instructor effectiveness (Emerson & Hazlett, 2012; Miller & Rebelein, 2012). Findings from emerging South African research into teaching with economic games similarly show that their use can improve academic performance (Davis, 2011); moreover, students recognize that games benefit their learning as well as enhancing social skills, interest, motivation and confidence in their application of knowledge (Davis, 2011; Van Wyk, 2013).

Beyond these studies, alternative approaches to teaching have generally not been the focus of research in the South African literature on economics education, although they may be recommended tangentially as they arise from the findings of quantitative investigations of the determinants of academic performance (e.g. Horn & Jansen, 2009). The need for further research is suggested by the significant links that appear to exist between teaching methods, motivation, and performance in undergraduate economics (Van der Merwe, 2006, 2007).

This line of research comprising the exploration and advocacy of innovative pedagogical techniques is generally not contested, and where criticism exists, it is cautionary rather than substantive. For instance, Colander (2004) argues that content, rather than form, is central to economics teaching. He cautions against overemphasizing delivery and the excesses of the "new paradigm" of student-centred teaching, which underplays the role of academic as content expert. However, the "common sense"

approach he advocates does not preclude using more effective teaching techniques. A different caveat is the concern that overemphasis of the "learning" approach and teaching techniques may obscure and compound problems inherent in the abstract and monist nature of the economics curriculum (Wilson & Dixon, 2009), discussed further in section 2.2.2 below.

Overall, the rich strand of enquiry into alternative pedagogies — as yet underrepresented in South Africa — has the broad aim of enhancing teaching and promoting active learning in undergraduate economics. Many authors theorize around possible reasons for the effectiveness of these approaches, while some studies back up their use with quantitative and anecdotal support showing improved academic achievement by students taught through these methods. However, more detailed, qualitative investigation of the possible reasons why these approaches are effective in enhancing students' learning of economics is largely absent from these studies.

2.2.2 Curriculum and content concerns

A second, intertwined strand of scholarship and debate focuses on the content of the typical undergraduate economics curriculum, where criticisms are levelled at both the volume and pace of content (particularly in introductory courses), and its overly narrow, abstract, and/or irrelevant nature. These critiques have led to calls for the rationalization of content, greater use of practical examples and application, and a more pluralistic approach to curriculum design.

2.2.2.1 The overstuffed curriculum

Arguments for streamlining economics curricula centre on the extensive, overwhelming and "encyclopedic" nature of their theoretical content (Davies & Mangan, 2007a; Frank, 2005, 2006, 2012; Hansen, Salemi & Siegfried, 2002; Schneider, 2012, p. 285). Generally, "overloading syllabuses with content leads to poor learning" (Ramsden, 2003, p. 70). Thus most students taking introductory economics fail to learn fundamental concepts, because "courses try to teach students far too much, with the result that everything goes by in a blur" (Frank, 2006, p. 58). The excess of content and

theory has obvious implications for teaching and learning, reinforcing the reliance of teachers on standard 'chalk and talk' pedagogy, and of students on surface learning or memorization rather than deep learning (Schneider, 2012). The suggestion is therefore made that because a "relatively small number of basic principles do most of the heavy lifting in economics" (Frank, 2006, p. 58), students' mastery could be enhanced by reducing the breadth of the curriculum and the pacing of modules, to allow a deeper focus on that smaller set of critical concepts and the development of the associated disciplinary thinking skills through real-world applications.

Arguments for rationalizing content should, however, take cognizance of the level and purpose of the course (Mendeloff, 2008): the case made by Frank (2006) and others may be most pertinent for terminal, introductory courses, where students will probably not have further exposure to economics and do not need to develop prerequisite technical skills. However, the issues remain relevant for the intermediate level (including the Intermediate Microeconomics module that forms the case for this study), where the approach and coverage depend upon and align with those of the preceding introductory courses. Intermediate Microeconomics is intended to develop students' application and transfer of the theory and tools learnt in the introductory course (Green et al., 2013; Nicholson, 2012), but this is often thwarted because they lack deep understanding and well-developed frameworks within which to integrate new knowledge. Adding further theoretical models of increasing complexity to frequently precarious foundations compounds these problems. The question of breadth recurs at the intermediate level, because the number of potential models and topics that might be covered has "exploded" in recent years, and lecturers must address the trade-off between covering new topics and the "probably inevitable" deterioration in students' learning of the remaining standard topics (Nicholson, 2012, p. 436).

A stronger counter-argument against the "remedial" approach of reducing content in the hope of improving learning is exemplified by Becker (2004), who maintains that the main problem in economics education is not an excess of topics, but a lack of relevant and cutting-edge content (largely because innovations in practice are not yet in texts), and the reluctance of many academic economists to embrace innovative teaching techniques such as those described above, perhaps because they anticipate high start-up costs. Thus "[r]educing economics to the dogmatic preaching of a few basic axioms in

(introductory and intermediate) classes in institutions of higher education misses the excitement of the discipline. Let's show students that economics is a discipline that is innovating and evolving with social change" (2004, p. 57). This view links to the second set of charges aimed at economics curricula, which centre on issues of relevance.

2.2.2.2 Ideology, relevance and context

Disciplinary introspection about economics curricula is not new, although it has intensified in recent years. At a fundamental level, the view that the discipline is ideologically neutral is contested (Docherty, 2010; Fine, 2013; Heilbroner, 1987). It may be argued that economists' use of abstraction from reality and dissociation from morality, politics and values is in itself ideological because it is selective, in ways economists themselves may not recognise (Heilbroner, 1987). The discipline is presented as being value-free, but "words such as wealth, waste, public, private, efficiency, value — indeed, all the interesting and important terms in the economic lexicon — embody political and moral presuppositions and premises", which students should at least be taught to identify (Heilbroner, 1987, pp. 119–20). Far from being value-free, the depersonalization of "economic agents" (into the unboundedly rational homo economicus[11]) "implies a particular view … which subtly permeates into the normative aspects of the analysis" (Scerri, 2008, p. 758). Teaching neoclassical theory as universally applicable, and underplaying its flaws and limitations, may even undermine students' values by weakening the idea of community based on reciprocity and altruism that conflicts with the individualistic, market-driven neoclassical approach (Marglin, 2009).

Alternative critiques do not see the economic way of thinking as inherently ideological in itself, but target the questions typically examined in the teaching of economics. These concerns persist in current critiques of economics curricula, with which Joan Robinson's words still resonate:

[11] Behavioural economics directly addresses this characterization of rationality and accounts for the ways in which people are not infinitely self-interested and calculating — this is one of the alternative schools of thought which proponents of a more pluralistic approach believe should receive more attention in undergraduate curricula.

> [E]conomic theory, in itself, preaches no doctrines and cannot establish any universally valid laws. It is a method of ordering ideas and formulating questions … But why do we pick out for treatment just that selection of topics that is least likely to raise any questions of fundamental importance? (1960, pp. 173, 175)

Contemporary orthodox teaching still faces the charge of ignoring important questions which are most relevant to students as the discipline becomes "more abstract, theoretical and mathematical, and less policy oriented over time" (Emami, 2005, pp. 61–2).

Critics denounce the essentially "monist" approach to the discipline: "the wilful narrowing of content and the standardizing of the economic canon at the expense of heterodoxy and the history of ideas. The problem at root is that economic principles are taught with little or no regard for the theoretical controversies, disputes and social context from which they emerge" (Wilson & Dixon, 2009, p. 92). Alternative perspectives to neoclassical theory have been afforded less and less attention in mainstream curricula, particularly at introductory and intermediate levels, while economic history and the history of economic thought have been relegated to peripheral elective courses (Cohen & Emmett, 2012). This narrowing of the curriculum limits students' knowledge and is argued to circumscribe the development of critical thinking and the ability to apply economic tools effectively (Docherty, 2010; Saunders, 2008), thus failing to equip students to address the challenges of economic development (Scerri, 2008). The perceived irrelevance resulting from the dominance of abstract, ahistorical and decontextualized theory is likely to erode students' enthusiasm and motivation to study economics (Mendeloff, 2008; Saunders, 2008; Van der Merwe, 2006).

All of these charges have led to growing global calls for greater pluralism in economics curricula (Colander, 2013; Denis, 2009; Freeman 2010; Mearman, Wakeley, Shoib & Webber, 2011; Peterson & McGoldrick, 2009), particularly in the wake of the "systemic failure" of the economics profession (Colander et al., 2009) as a whole to foresee and understand the financial crash of 2008, and the resultant general loss of credibility of economics. Pluralism entails teaching diverse theoretical perspectives in addition to the neoclassical orthodoxy, bringing back an emphasis on the history of economic thought, and prioritizing the role of controversy in teaching (Freeman, 2010; Mearman et al.,

2011). This global movement has been strongly influenced by student activists, who have increasingly criticized the content of university economics teaching, forming 'Re-thinking Economics' and 'Post-Crash Economics' societies with growing support from academics and incipient impacts on the way economics is taught[12]. The chorus of similar voices is growing in South Africa, where some academic economists have protested the remoteness of taught content from reality for some time (Saunders, 2009; Scerri, 2008; Van der Merwe, 2006). More recently, students and academics have situated questions around economics currricula within broader 'decolonizing' debates in higher education (see for example Bassier, 2016; Chelwa, 2016; Fourie, 2016), where the decontextualized teaching of neoclassical theory is seen as not only irrelevant but also arguably immoral in its neglect of South Africa's economic realities.

2.2.2.3 Towards reconciling tensions, and a return to my focus

So far, this review of the first two strands of economics education research has revealed some significant tensions centring on the relative emphases that should be placed on content versus form of teaching; breadth versus depth of coverage; and developing technical skills versus exploring questions that students see as relevant. Clearly, content and pedagogical issues are closely entangled, but this does not imply a trade-off whereby one is enhanced at the expense of the other — on the contrary, reconciling these tensions calls for simultaneous pedagogical and curricular shifts, because the teaching approach adopted cannot be untied from the questions addressed in economics courses. As Becker has pointed out, there is scope to strengthen both aspects simultaneously in tertiary economics teaching (Becker, 2004).

The distinction between "big think" and "little think" questions (Colander & McGoldrick, 2009) is a useful way of defining and exploring these tensions. "Big think" questions are those which "question the foundation of the disciplinary analysis and transcend the disciplines" (2009, p. 5), which require deep and critical thinking, and which may have no definite answers, but foster a deeper understanding of the discipline

[12] See the International Student Initiative for Pluralism in Economics (2016) at www.ISIPE.net for a listing of affiliated student groups from universities around the world, and CORE (2016) at www.core-econ.org for an alternative approach to teaching which is gaining traction through pilot programmes at several universities in a range of countries.

and of its applicability and limitations. By contrast, "little think" questions focus on smaller problems, are easily answered with economic tools, and usually extend knowledge in small ways. In a description that encompasses most of the foregoing criticisms, the 'problem' with economics teaching can be summed up as too much focus on "little think" questions, which hone technical and quantitative skills but do not challenge students to think about the underlying assumptions or limitations of those skills (Colander & McGoldrick, 2009). Adjusting the focus of courses to include more "big think" questions, without neglecting the development of the necessarily skills to enable students to address those questions 'like economists', has pedagogical implications: "big think" questions by nature require interactive and engaging techniques. This approach is compatible with harnessing the "excitement of the discipline" (Becker, 2004, p. 56) by including cutting-edge content in teaching, while also shifting to more active learning techniques — in short, fostering pluralism in teaching methods as well as in content.

In this study, I set out to explore how students learn in economics, rather than to pursue any grand solutions to teaching and learning problems; but all of these concerns and tensions form essential parts of the disciplinary context. Having outlined these debates, and in particular the critiques centred on the dominance of undergraduate curricula by neoclassical theory, it seems appropriate to reflect briefly on my focus: students' learning of the concepts and the way of thinking we expect them to acquire in introductory and intermediate microeconomics courses. After all, these concepts and perspectives — which will be expanded upon in subsequent sections — are all essential components of a neoclassical toolbox.

Notwithstanding the criticisms, certain principles in themselves are still agreed upon as core to the discipline (Siegfried, 2009, and as discussed in Chapter 1), particularly in microeconomics (Mendeloff, 2008); there are standard requirements of undergraduate microeconomics, which are in turn drawn on in advanced courses — even if the latter take more heterodox approaches. This non-negotiability of the inclusion and ordering of some ideas in undergraduate curricula is spelt out by Siegfried (2009, p. 219):

> Economists teach the basic principles of economics — opportunity cost, marginal analysis, the role of prices as signals, incentives, specialization, unintended consequences — regardless of the name of the course to which

> they are assigned … The content of core courses that are used as prerequisites for other courses must be transparent and fairly stable so that those counting on student understanding of prerequisites can organize their courses to take advantage of the sequential nature of the curriculum and move on to deeper analysis.

Certain concepts must be mastered if a student is to become able to think like an economist — and indeed, to know when it is appropriate to do so. An awareness of the broad debates and critiques discussed in this section is important, because they have a bearing on what we mean by knowledge and learning in economics. If we as educators wish our students to develop deeper understanding, higher order skills and critical thinking, then our conception of learning in economics includes not only that they know which analytical tools they can use, but also that they understand when it is appropriate to use these tools, and what their limitations may be in different situations. Significantly, Siegfried (2009) points out that the frequently quoted aim of "teaching students to think like an economist", usually attributed to his earlier work (Siegfried et al., 1991), is in fact a contraction that does not capture the authors' full intended meaning:

> We asserted that the overarching goal of economics education should be to 'enable students to develop a capacity to think like an economist'. … Our committee did not believe that all students should think like economists everywhere and all of the time. Indeed, we explicitly articulated among ourselves that we hoped students would understand how to think like an economist, and then use that method of analysis when, and only when, they thought it appropriate. … Students should be shown the opportunities and disadvantages of various methods of analysis, but then left to themselves to decide when it is appropriate to 'think like an economist'. To think like an economist means to know when to use economic thinking, and when not to do so. (2009, p. 215)

This returns us to the consideration of developing new ways of thinking, how students may attain economic understanding, and why they frequently find the learning process difficult or troublesome — and this is the main theme of the third broad strand of research in economics higher education.

2.2.3 Student learning perspectives

Research into student learning in this strand is strongly based in educational psychology and theories of learning, and focuses on investigating the processes of learning, rather than designing new methods or revised curricula. (Note again though that the separation of research strands I have used is expedient and not absolute — much of this work has links of mutual influence with the concerns around teaching and content in economics described in the previous two sections.) Students' approaches to studying, conceptual development, and perceptions and experiences of learning are important themes, and qualitative research methodologies are prevalent. This research strand derives primarily from the UK, Europe and Australasia, and is less in evidence in the USA (Reimann et al., 2005) — and appears to be entirely absent from South African economics education research. Since 2005, much of the research based on student learning in economics has drawn on the theory of threshold concepts (which originated largely from this strand), as this study does. This explicitly TCF-related work is reviewed separately and in more detail in Chapter 3.

2.2.3.1 Cognitive and social processes in learning

The influence of educational psychology on this body of research is evident in both the cognitive and social views of learning it draws on. Cognitive psychology has informed understanding of the processes of and influences on learning (including previous knowledge and experience, abilities and learning styles, personality and motivation), in seeking explanations for differences in learning outcomes (Entwistle, 2009). Social learning perspectives stem from the work of Vygotsky and Bruner. From Vygotsky's views, "an alternative view of human learning has developed, seeing human actions as dependent on their intentions, on their interpretations of their experiences in the everyday social world and on the language through which those experiences are discussed" (Entwistle, 2009, p. 23). Bruner has emphasized the fundamental intellectual activity as "meaning-making" — "situating encounters with the world in their appropriate cultural contexts in order to know 'what they are about'" (2009, p. 161). This is an inherently social process, because meanings "have their origins and their

significance in the culture in which they are created … Learning and thinking are always situated in a cultural setting" (Bruner 2009, p. 161). Relating this directly to disciplinary learning returns us to the idea of requiring students to develop the ability to think like an economist: "understandings have to be expressed within an accepted academic discourse, using the concepts and ways of treating evidence that are characteristic of the discipline … And each discourse amounts to a contrasting culture into which students have to be gradually inducted" (Entwistle, 2009, p. 23).

Examination of learning from an educational psychology perspective has defined it explicitly in terms of the conceptual change that is demanded of students if they are to think in disciplinary ways. Thus, for instance,

> when a student begins a course in economics by thinking that price is determined by the value of an object, and ends it by having a conception of price as system-dependent, then learning has occurred. There has been a movement from one way of conceptualizing a phenomenon to another, qualitatively distinct one. The student looks at the phenomenon, at some aspect of the world, quite differently. (Ramsden, 2003, p. 37)

This distillation of what may constitute learning contrasts with the disappointing learning outcomes frequently encountered in reality — such as those noted with regard to economics in section 2.2.1 above, which resonate with the view that "very large numbers of students appear to be learning an imitation of … the disciplines they are studying, a counterfeit amalgam of terminology, algorithms, unrelated facts, 'right answers', and manipulative skills that enables them to survive the process of assessment" (Ramsden, 2003, p. 37).

2.2.3.2 Approaches to learning

Some light is shed on these difficulties by the examination of students' "approaches to learning" (Marton & Säljö, 1976). "Deep" and "surface" approaches to learning may be discerned, distinguished by students' intentions for understanding versus reproduction. Learners taking a deep approach engage in an active search for meaning, create connections with their existing knowledge and everyday experience, and can integrate

new information into their personal understandings. By contrast, those taking a surface learning approach focus on isolated parts of the whole in order to memorize what they might be questioned about later (Entwistle, 2009; Ramsden, 2003). While a surface approach may still allow some students to attain reasonable grades, a deep approach is "the best, indeed the only, way to understand learning materials" (Marton & Säljö, 1984, p. 46) — and is associated with higher quality outcomes, higher grades, and greater student enjoyment (Ramsden, 2003).

New directions enabled by this "groundbreaking" view of learning included the investigation of learning outcomes in terms of the meanings students make; the impact of students' intentions on learning outcomes; and the effect of students' perceptions of their context on approaches to learning (Entwistle, 2009, p. 26). Researchers have pursued these ideas using interviews to provide deeper understanding of students' experiences and perceptions of learning, forging the student experience of learning (SEL) approach and the development of phenomenography (Entwistle, 2009; Marton, Hounsell & Entwistle, 1984; Ramsden, 2003).

The SEL perspective highlights that students' approaches to learning may be influenced by several contextual factors, including their interest, knowledge base and previous experience, and in the immediate ambit of study, by teaching and assessment practices (Ramsden, 2003). The latter are significant because students' chosen approaches to learning are at least partly a strategic response to these practices (Bloemhof, 2012) — a view which accords with Biggs's argument (1996) for constructive alignment of intended learning outcomes, teaching and learning activities, and assessment. In economics, the standard practices of 'chalk and talk' teaching and narrowly interpreted formal assessments (often relying heavily on multiple choice) may be seen as directly inducing surface learning, by creating or reinforcing students' perceptions that knowledge is a quantity (Dahlgren, 1978) and that learning means retaining (at least in the short term) and reproducing a vast amount of information. Furthermore, even those students who may be predisposed to seek meaning and understanding will adopt surface approaches if they believe these are adequate to meet lecturers' expectations (Bloemhof, 2012).

From this stance, concerns about learning outcomes in economics can be characterized in terms of the predominance of surface learning approaches, and the resultant need to

find ways of promoting deep approaches instead — a point recognized by many of the studies reviewed above, and implicit in those advocating for more active and engaging pedagogy. (See Green et al. (2013, 2015), and Dubas and Toledo (2016) for examples of teaching techniques in economics explicitly intended to promote deep learning approaches and associated attainment of higher order thinking.) Nonetheless, approaches to learning (and their impacts) have not been deeply explored in economics education. Bloemhof (2012) notes that the economics education literature reflects the enduring misconception that deep learning is amenable to measurement by students' performance on 'deep' or 'surface' learning sections of traditional exam assessments (see for example Santos & Lavin, 2004) — a view which "confuses the curriculum with the learner's intention" (2012, p. 62). Provisional evidence from recent SEL research suggests that problem-based learning (PBL) in economics can foster deep approaches and develop proficiencies not captured by grades on standard assessments — such as critical thinking, engagement, self-reflection, teamwork, problem-solving and knowledge transfer; however, these impacts, as well as the "affective and ethical dimensions" of economics proficiencies, remain under-investigated, and merit further qualitative investigation (Bloemhof, 2012, p. 64).

2.2.3.3 Phenomenography and conceptions

Phenomenography, which has arisen from the SEL approach, uses close scrutiny of students' conceptions of specific topics or concepts — "the individual meanings which students assign to a particular text, principle, idea and so on" (Marton & Säljö, 1976, p. 4) — in order to describe how the content has been understood, to identify qualitative differences in learning, and explore the sources of that variation. It is based on the view that abstract or complex concepts are likely to be understood in different ways: people may develop different individual "conceptions" of these ideas that depend on their prior knowledge and experience, and that may not match the understandings expected by teachers or the discipline. Students' understanding of price as outlined above is a classic example of this approach, based on a study by Dahlgren (1978, cited in Dahlgren, 1984) investigating students' explanations of the price of a bun. Students saw price either as reflecting the 'true' value of the bun, or as the result of supply-and-demand interactions.

This perspective enables a much finer definition of learning as a change in conception[13]: having changed from the former to the latter notion of price, the student "has achieved more than the acquisition of an understanding of the laws of supply and demand. For the student, the phenomenon of price is now looked at in a fundamentally new way" (1984, p. 31). The phenomenon, or the idea of price, is invested with a meaning and is no longer merely a disembodied fact that may or may not be retained.

Phenomenographic approaches have been used to draw insights from a more fine-grained look at how students' learning outcomes in economics may be associated with variation in prior knowledge (Meyer & Shanahan, 2001, 2002, 2004; Shanahan & Meyer, 2001, 2003). Students bring a wide range of educational backgrounds and experiences to university study. They are thus likely to have diverse views of (and approaches to) what constitutes knowledge and learning, as well as varied views about economic phenomena — "what economics is, what economists do, mechanisms of price determination, and so on" (Meyer & Shanahan, 2004, p. 443). This perspective adds to our knowledge of possible sources of disciplinary difficulty: if students' notions of learning are dissonant with the expectations of the university, or if their economic preconceptions are at odds with fundamental disciplinary understandings, they will be at a disadvantage before even beginning their studies (Meyer & Shanahan, 2004; Shanahan & Meyer, 2003). The need to develop students' metalearning capacity — their awareness of themselves as learners — emerges as an important implication of this line of research.

To conclude, research in this third strand has emphasised that academic understanding centres on meaning-making within the disciplinary framework, and that it requires conceptual change — at the level of individual concepts, and in a transformed way of thinking — which in turn demands a deep approach to learning. The reliance on students' expressions of their experiences and perceptions of learning is a marked departure from the rest of the field of economics education research. The methodological approaches used have also opened up the scope of research to include

[13] The idea of pre- and misconceptions has been addressed by authors taking different approaches too — for instance, Strober and Cook (1992) analysed video footage of students working in groups, and noted the importance of misconceptions derived from 'everyday' (instead of economic) meanings in hindering students' concept formation. While not in the phenomenographic tradition, this is clearly a cognate approach in its focus on processes and conceptions. Preconceptions as a source of disciplinary difficulty are considered further in section 2.2.4 below.

constructs such as identity and self-confidence (Entwistle, 2009) (although in relation to economics, it appears that these only begin to be addressed by later threshold concepts-oriented work).

The themes and approaches within the 'student learning' line of research provided most of the seeds and sustenance for the emergence of the threshold concepts perspective on learning (and teaching) that has gained prominence since the mid-2000s. A more detailed consideration of the TCF and associated relevant research is provided in Chapter 3. Before proceeding to that discussion, it is appropriate to review the potential sources of difficulty encountered by economics students that the literature suggests may arise from the nature of the discipline itself. The TCF has as one of its most important facets the premise of "troublesome knowledge" (Perkins, 1999): new disciplinary knowledge may prove troublesome in different ways if learners find it to be counter-intuitive, conceptually difficult, alien or incoherent (Meyer & Land, 2003). Many features of economics that are congruent with this notion have long been recognized by economics educators, and section 2.2.4 provides an account of these.

2.2.4 Potentially troublesome disciplinary features

Potential sources of disciplinary 'troublesomeness' exist at the intersection of student experiences of learning, the nature of the discipline, teaching approaches and content. The discussion which follows represents a 'first take' from the spectrum of existing research. Understanding of the extent to which these features are indeed troublesome for students in our context is still largely speculative; nor do we know how comprehensive this listing is, or what other sources of difficulty may be lurking unrecorded, since few of these issues have been deeply explored in South Africa.

First, the distinctive 'new languages' which students of economics have to learn are likely to present challenges. Many of the concepts or 'facts' of economics are not directly observable but need to be understood through symbols (such as language): the "tools" provided by the culture (in this case, the discipline) "for organizing and understanding our world in communicable ways" (Bruner, 2009, p. 161) — in other words, for conceptualizing. In economics, three languages are used: verbal, graphical, and algebraic representation ('words, graphs and maths'), which are regarded as

equivalent ways of describing theoretical concepts and relationships. Initiates to the discipline are expected to master all three, which may necessitate learning new vocabulary (and becoming adept at translation across the languages) in order to understand concepts and express that understanding (Hedges, 2008).

Mathematics is "deeply entwined with economics, both by history and practice" (Benedict & Hoag, 2012, p. 334). Many economic constructs are built around embedded mathematical concepts — for example, the ubiquitous concept of marginality, and the relationship of marginal to average (Siegfried et al., 1991). Mathematical tools are used in almost every economics course, from the introductory level onward. Clearly, mathematical aptitude and existing skills are useful in learning economics (Siegfried et al., 1991), and many quantitative studies confirm students' mathematical abilities as determinants of their success in economics modules (see Arnold and Rowaan (2014), Ballard and Johnson (2004), Benedict and Hoag (2012), Denny (2014), Owen (2012) Von Allmen (1996); while Parker (2006) and Bokana and Tewari (2014) report the same finding in South Africa). Equally, students whose schooling has not equipped them with the requisite level of quantitative literacy will be at an immediate disadvantage (Schuhmann, McGoldrick & Burrus, 2005; Tewari, 2014).

The effects of graphical representation on learning in economics are not as well established as those of maths, but it seems clear that students who have trouble understanding and using graphs will also experience difficulty with economics (Strober & Cook, 1992; Cohn, Cohn, Belch & Bradley, 2001, 2004). The sources of students' graph-related difficulties are complex, and may point to broader misunderstanding of economic concepts, as well as obstacles around seeing graphical models as meaningful representations of real phenomena, or translating the facts of problems into graphical form (Strober & Cook, 1992). It may be that graphs constitute a form of "ritual knowledge" (Perkins, 1999), having a "routine and rather meaningless character" for students if they are committed to memory without full understanding (Shanahan & Meyer, 2006).

Verbal discourse may be a more familiar form of representation for economics students, but can be just as problematic. Indeed, while some of the words they encounter may be new and unfamiliar, a greater problem is that many economic terms, such as "price", "demand", "efficient", "rent", or "capital", are also used in common speech, so that

students need to discern how their technical use in economics differs from their lay, everyday use and avoid confusing the two meanings (Lee & Entwistle, 1975; Strober & Cook, 1992). This difficulty may be compounded for students for whom English is an additional language (Dyer, 2012; Ojo, 2012) — a finding which is in line with some South African quantitative evidence highlighting the importance of verbal ability for students' achievement in economics (Parker, 2006), and of having English as a home language for success in management studies (Bokana & Tewari, 2014).

A related challenge (highlighted by phenomenographic studies discussed in section 2.2.3, and congruent with the idea of learning as conceptual change) is the need for students to examine and modify their existing (mis)conceptions around everyday understandings of economic experiences. These economic preconceptions are often deeply held and persistent (Shanahan & Meyer, 2003; Simkins & Maier, 2009); they are useful in allowing students to impose meaning and order on their experiences, but can be problematic if they are at odds with disciplinary understandings (Reimann & Jackson, 2006; Strober & Cook, 1992). Reaching economic understanding of concepts such as "money", "wealth/income", or "shops" may require that students reconsider terms whose meanings have thus far been formed through their previous experiences (Thomas, 1987, p. 52) to make way for new conceptions, which may then be experienced as troublesome[14].

Reaching conceptual understanding may be further complicated by the composite nature of many concepts in economics — they may be built on lower order concepts, or have to be understood in relation to other concepts (Davies & Mangan, 2007a; Ojo, 2012). Thus an economic understanding of concepts like "cost", "price", "elasticity", "the standard of living", or "the law of diminishing marginal returns" depends on "students' ability to perceive them as operational systems" (Thomas 1987, p. 53). For instance, section 2.2.3 noted that in economics, students are required to come to understand price not as a one-dimensional, observable feature, but as arising from (and serving to bring equilibrium to) a system of supply and demand (Dahlgren, 1984). Similarly,

[14] This is not unique to economics but applies in any field (e.g. physics or geography) where students will have had prior exposure to some of the phenomena studied within the discipline, and have their own personal or 'folk' explanatory theories. The idea that transforming one's existing conceptions is difficult has been eloquently expressed by many theorists, including Dewey (1933, cited in Land, 2016, p. 14): "The path of least resistance and least trouble is a mental rut already made. It requires troublesome work to undertake the alteration of old beliefs".

understanding of diminishing marginal returns requires simultaneous awareness of the assumption of a fixed factor of production; while comprehending elasticity requires students to apply a rule linking proportional changes in variables, as does the standard of living implied by GDP per capita (Thomas, 1987, p. 53).

Another potential source of difficulty lies in the nature of economic epistemology and the demands this makes on students: constructing valid economic arguments requires dissociation and objectivity. Mastering economic explanation involves using essential tools such as *ceteris paribus* assumptions and the idea of opportunity cost, and offering solutions based on logical, scientific economic reasoning (Colander, 2004; Entwistle, 2005) rather than on naïve personal or popular opinion (Ashwin, 2008). Overcoming tendencies to rely on the latter may require some practice.

A related challenge arises from the abstract nature of theory, which students may perceive as unrealistic and thus irrelevant (Emami, 2005; Van der Merwe, 2006; Wilson & Dixon, 2009). Generalization of theoretical principles necessitates abstraction from reality. If students do not recognize both the legitimate grounds for such abstraction, and the relationship between abstracted concepts and the real-world situations from which they are drawn, it may be difficult for them to grasp the logic, meaning and usefulness of the theoretical ideas. Furthermore, if students do not see how economics can shed light on issues that they care about, their motivation to learn may be undermined (Mendeloff, 2008).

In short, learning economics can be challenging because it demands that students be prepared to redefine terminology, reformulate pre-existing conceptions, and realign their attitudes towards the nature of economic argument. While these challenges have been sketched in this preliminary view as arising from strictly disciplinary features, they manifest in reality in interaction with the immeasurable diversity of individual learners and their contexts. A full understanding of difficulty has to take account of far more than the principles and practices of the discipline.

2.3 Concluding comments

The review of the literature gives credence to the impression that students often find economics difficult, and links learning challenges to troublesome disciplinary features, stagnant teaching approaches, and curricula that may be overfull and/or irrelevant. Arguably, contemplation of the difficulty of a discipline or concept immediately suggests dimensions beyond the cognitive: difficulty is inextricably associated with feelings, and draws on personal resources in addition to cognitive capacities. However, with the exception of some areas of the 'student learning perspectives' strand, the literature reviewed above has largely been silent on these dimensions of learning. Relatively little is known about students' experience of these dimensions, and our qualitative understanding of how students learn in economics is limited, particularly in South Africa where research approaches have been almost exclusively quantitative. Some of the concerns reflected in the international literature may be heightened, or experienced differently in the South African context; apart from some suggestive quantitative evidence, we have few insights into the qualitative aspects of learning economics here.

Consideration of the nature of learning in economics in this chapter and Chapter 1 suggests that success and progression in the discipline requires a mastery of core concepts that brings about a transformation in students' thinking, as they move through introductory and intermediate modules and develop the ability to 'think like an economist' (Hansen, 2001; Siegfried et al., 1991). A shared understanding among economics educators that the grasp of particular concepts opens up the discipline in this way has been formalized and elaborated in the idea of threshold concepts (Meyer & Land, 2003): "…'conceptual gateways' or 'portals' that lead to a previously inaccessible, and initially perhaps 'troublesome' way of thinking about something" (Meyer & Land, 2005, p. 373). A defining feature of the threshold concepts view of learning is the emphasis it places on the affective, metacognitive, and ontological aspects that accompany the conceptual transformations of disciplinary learning. The TCF forms the theoretical framing for this study, and is presented in more detail in the following chapter.

CHAPTER 3
THEORETICAL FRAMING: THRESHOLD CONCEPTS

3.1 Introduction

This chapter considers the theory of threshold concepts, which frames this study. The review of the major strands of research in economics higher education in Chapter 2 revealed that the teaching of the discipline internationally is characterized by common (but criticized) approaches and content, and widespread concerns about the quality of learning students attain. The threshold concepts framework (TCF) has proven to be a generative line of enquiry for enhancing understanding of students' learning of this common disciplinary content. The TCF has its deepest roots in the 'student learning perspectives' research strand, but also feeds into debates around teaching approaches and curriculum content.

I chose the TCF to frame this study for several reasons. The idea of threshold concepts emerged from studies of teaching and learning in economics, and appeared to fit well with the path and features of disciplinary learning as I understood them from my own years of experience of teaching economics to undergraduates. Because TCs are discipline-based, I was able to engage immediately with the approach, despite my (formal) training in economics and not in education practice (as predicted by Cousin, 2006, and Lucas & Mladenovic, 2007). The disciplinary origins also meant there was also a body of precedent studies on which I could draw and build. The TCF specifically addresses difficulty and its emotional connotations — the approach "has restored difficulty to learning. In particular, threshold concept proponents have always insisted that the cognitive and affective are enmeshed and enquiry into how this may be so marks out this field as distinctive" (Cousin, 2016, p. ix). The TCF is catholic in its embrace of relevant ideas from a range of learning theories and other disciplines, which it draws together into a coherent view that can be used to illuminate the complexity of learning. The framework could therefore accommodate the questions around learning I was interested in, and yield insights beyond quantitative success factors or assessments of progression in understanding, to generate a holistic and qualitative view.

Section 3.2 introduces the TC view of learning and its distinctive features. Section 3.3 briefly traces the theoretical lineage of the TCF and notes recent research directions, and section 3.4 outlines the main critiques of the approach. The application and development of the TCF in economics education is reviewed in section 3.5. Thereafter, section 3.6 positions my study with regard to existing scholarship in economics education and the TCF, outlining key areas where I hope to contribute to understanding of economics students' learning.

3.2 A threshold concepts view of learning

The theory of threshold concepts emerged from the economics strand (Meyer & Land, 2003) of a UK-wide research project (Enhancing Teaching and Learning Environments in Undergraduate Courses). Subsequently, the Embedding Threshold Concepts[15] (ETC) Project, implemented at several UK universities in 2004–8, "established threshold concepts as an organizing principle in research into undergraduate learning in economics" (Burchmore et al., 2007, p. 5). The threshold concepts framework (TCF)[16] has rapidly become established in the literature on economics pedagogy and in a range of other disciplines[17].

The TCF offers a way of conceptualizing and describing learning, and interrogating the reasons some students struggle to grasp particular content. The framework is not a proposed 'solution' to learning difficulties or a testable hypothesis, but a sensitizing concept (Atherton, 2010) that gives rise to some broad pedagogical principles and curriculum-design considerations (Barradell, 2013; Davies & Mangan, 2007a; Land, Cousin, Meyer & Davies, 2006). Because it foregrounds discipline content and perspectives, a threshold concepts approach is recognized as a powerful means of

[15] This project, hosted by Staffordshire University in collaboration with three other UK universities, ran from 2004-2008. The teaching materials are freely available for download from the project website at http://www.staffs.ac.uk/schools/business/iepr/etc/index.htm.

[16] Some variation exists in the literature, but I will use "threshold concepts framework" or TCF to denote the analytic framework, way of conceptualizing learning, or body of scholarship and orientation in teaching; and "threshold concepts" or TCs for the specific disciplinary concepts (e.g. in economics these are likely to include opportunity cost, rationality, marginal analysis, efficiency — as elaborated in section 3.5).

[17] A current online database listing TC-related research is maintained at http://www.ee.ucl.ac.uk/~mflanaga/thresholds.html. As of December 2016, the site listed 41 academic publications in the discipline of economics since 2005, and 62 completed PhD and Master's theses with TC as a central theme or 'serious discussion' of TCF.

opening up discussion into disciplinary teaching and learning concerns. TC research can be described as "transactional curriculum inquiry" (Cousin, 2008, 2009), which requires and advances a partnership between subject specialists, educational researchers and learners (Barradell, 2013; Higgs & Cronin, 2013; Lucas & Mladenovic, 2007).

3.2.1 Characterizing threshold concepts

The seminal definition (Meyer & Land, 2006, p. 3) introduces the idea of a threshold concept as:

> akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress. As a consequence of comprehending the threshold concept there may thus be a transformed internal view of subject matter, subject landscape, or even world view. This transformation may be sudden or it may be protracted over a considerable period, with the transition to understanding proving troublesome. Such a transformed view or landscape may represent how people 'think' in a particular discipline, or how they perceive, apprehend or experience particular phenomena within that discipline (or more generally).

Threshold concepts in any discipline are likely to have several characteristics (Meyer & Land, 2003, pp. 5–7):

- **Transformative** — entailing a conceptual and (possibly) an ontological shift as new understandings and perspectives bring about a new sense of self.
- Probably **irreversible** — the learner is unlikely to forget the concept once understood (though it may be modified or refined over time).
- **Integrative** — a threshold concept reveals the interrelatedness of a phenomenon, allowing the learner to make connections that were previously not apparent.

- Possibly often (though not necessarily always) **bounded** — a conceptual space will be delimited by its borders with thresholds into new conceptual areas (and may thus serve to demarcate the discipline).
- Potentially (and possibly inherently) **troublesome** — a threshold concept may involve "troublesome knowledge" (Perkins, 2006) which is counter-intuitive, alien, or seemingly incoherent; or may involve tacit elements, troublesome language or an unfamiliar discourse.

Importantly, this set of likely features is not intended as a definitional checklist: learners will vary in their individual encounters with a given threshold concept, and in the degree to which they experience each characteristic (Meyer & Land, 2006; Meyer, Land & Davies, 2008). Recent work considers the transformative capacity of a threshold concept to be its "superordinate and non-negotiable" feature (Land, 2016, p. 16); in economics, its integrative nature has also received relatively more emphasis (Davies, 2012). Further likely features added to the original list (Flanagan, 2016) are TCs' **discursive** nature, in that they entail extended use of natural, formal or symbolic disciplinary languages (Meyer & Land, 2005), and **reconstitutive** aspects, whereby learners have to let go of or reconfigure their preconceptions (Land, Meyer & Baillie, 2010).

3.2.2 Essential elements of learning in the TCF

While threshold concepts themselves are inherently disciplinary, the approach transcends disciplinary boundaries: "the significance and potential of TC as an analytic framework derives from the universality of student experiences of difficulty in encounters with [deeply challenging] content in any — and all — of their respective fields" (Schwartzman, 2010, p. 22). Essential elements of the learning process within a TC orientation, as described in Schwartzman's theoretical framing (2010), are represented in the schematic below and explained in the subsequent paragraphs.

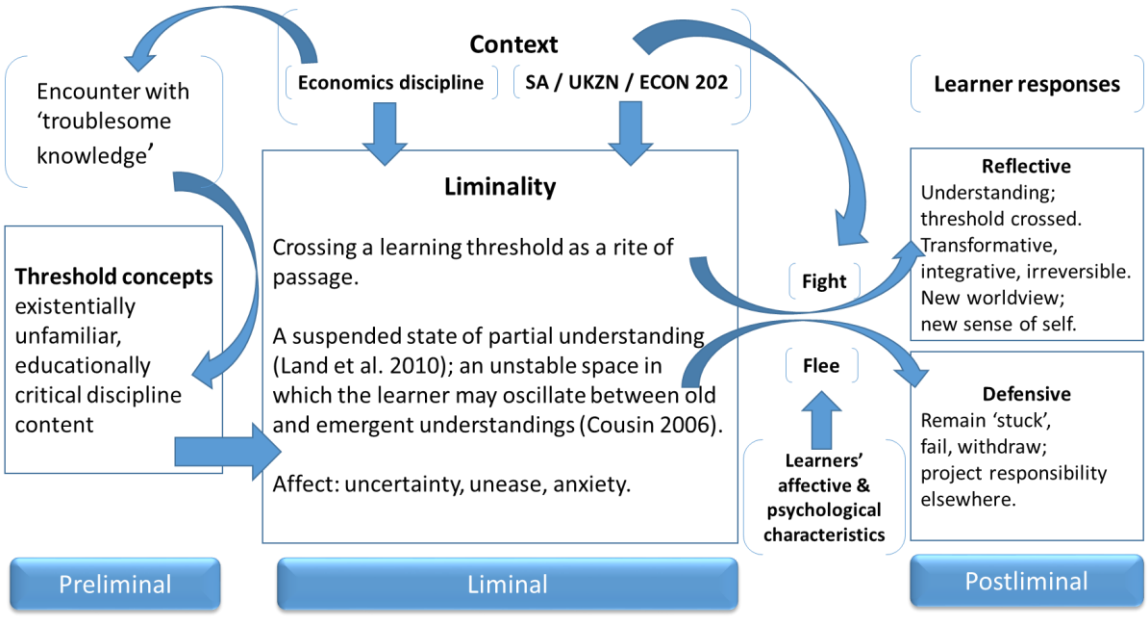

Figure 1. A threshold concepts view of learning

(based on Schwartzman, 2010 and Land et al., 2010)

The notion of "liminality" or a "liminal space" (Cousin, 2006, 2008; Land, 2013; Meyer & Land, 2005; Schwartzman, 2010) that must be traversed during the process of mastering a threshold concept is central to TC research. From the Latin *limen* for threshold, liminality may be described as "a suspended state of partial understanding" (Land et al., 2010, p. x), an "unstable space in which the learner may oscillate between old and emergent understandings" (Cousin, 2006, p. 4). Learners' entry into this space is precipitated by an encounter with "troublesome knowledge" (Perkins, 1999, 2006, as described in Chapter 2), which brings about a "rupture in knowing" as the learner's existing "meaning frames" (and their deficiencies or contradictions) are made explicit (Schwartzman, 2010). While a threshold concept constitutes "existentially unfamiliar, educationally critical" discipline content (Schwartzman, 2010), difficulty in learning does not reside only in this content — it cannot be separated from the learner, or the social context (Cousin, 2006). Learning, in this view, has affective as well as cognitive elements: acquiring a new concept can involve uncertainty, anxiety, discomfort, and sometimes a sense of loss, as learners relinquish prior understandings (Land, 2013, 2016).

In learners' encounters with the unknown (the "educationally unfamiliar"), the stages of rupture and explicitness elicit responses that may be either reflective or defensive (Schwartzman, 2010). If the learner's response is defensive, she will remain stuck, often projecting responsibility elsewhere (Schwartzman, 2010; Timmermans, 2010). By contrast, reflectiveness results when the learner successfully negotiates the liminal space and attains the intended understanding. Students' responses to challenges in the liminal phase of learning may be characterized as "fight or flight" (Berg, Erichson & Hokstad, 2016), and are impacted by features of the disciplinary and social contexts as well as students' intrapersonal resources — their affective and psychological characteristics (Rattray, 2016). Students' metalearning capacity — their awareness of, and control over, themselves as learners (Biggs, 1985) — is significant in helping them to traverse the liminal space of learning, attain deep-level learning outcomes (Meyer, Ward & Latreille, 2009) and cope with associated affective challenges, because "central to proficiency is one's own insight and personal agency" (Barradell & Kennedy-Jones, 2013, p. 8).

Learning a threshold concept is characterized as a discursive process, involving "the acquisition and use of new forms of written and spoken discourse and the internalizing of these" (Land, 2013, p. 2; Meyer & Land, 2003). In the suspended state of liminality, understanding can approximate to a kind of mimicry or lack of authenticity (Cousin, 2006; Land, 2013); despite the negative connotations, this may constitute a path towards deeper, integrated learning, although it also brings the danger that students' understanding may be arrested at this level of "ritualized performance" (Cousin, 2006, p. 5).

Ultimately, learning is a transformative process that goes beyond conceptual or cognitive change. Mastery of a threshold concept entails an ontological as well as a conceptual shift, because it results in a changed worldview or a reformulated meaning frame (Schwartzman, 2010). The shift in perspective which learning brings about may lead to "a transformation of personal identity, a reconstruction of subjectivity" — in which case it is also likely to have an affective component, "a shift in values, feelings or attitude" (Meyer & Land, 2006, p. 7). Such threshold crossing is commonly associated with the acquisition or development of "ways of thinking and practising" (WTP) in a discipline (Barradell & Kennedy-Jones, 2013; Entwistle, 2005; McCune & Hounsell,

2005). Identity shifts ensue because "learning always involves a process of becoming" (Cousin, 2008, p. 265); "developing a way of thinking reshapes an individual's identity, not only in relation to a particular academic community, but also in relation to other communities to which that individual has belonged … [or] might aspire to join" (Davies & Mangan, 2007a, p. 712).

3.3 Theoretical lineage and applications of threshold concepts

3.3.1 Lineage and theoretical affinities

The TCF eclectically weaves together insights from a range of learning theories and other disciplines (Cousin, 2006; Land, Meyer & Smith, 2008; Lucas & Mladenovic, 2007). The framework takes a social constructivist orientation in its views on learners' roles in constructing their knowledge in a social context. It reflects elements of both cognitivist and social learning perspectives — the former in its highlighting of transformative individual learning, and the latter in the emphasis on disciplinary boundaries and WTP (Burchmore et al., 2007). Threshold concepts can be said to encompass both the "product" and "process" of learning (Walker, 2013), and echo aspects of both "acquisition" and "participation" metaphors of learning (Sfard, 2009).

Parallels are evident with various theoretical conceptions of learning and types of knowledge (Entwistle, 2008; Illeris, 2009; Perkins, 2008). In its focus on the process of learning, and the transformation effected, TC aligns with conceptual change models (Carey, 1991; Vosniadou, 2008). Its interrogation of sources of difficulty links to Perkins's ideas of "troublesome knowledge" (2006). TC shares common ground with phenomenographic approaches, deep and surface learning metaphors, and variation theory (Marton et al., 1984) in its attention to how students conceptualise, approach and experience learning (Cousin, 2008).

The idea of threshold concepts stands in sharp contrast to the tradition of 'basic' or 'core' concepts loosely linked to the ideas of Piaget and early work by Bruner[18] (2009[1960]). The latter view asserts that fundamental disciplinary concepts can be authentically presented in simplified form even to young learners, implying that students should be introduced to these concepts at the beginning of their studies, and can build up more complex understandings by re-working the ideas they were introduced to as their studies progress (Davies & Guest, 2009). By contrast, a TC is conceived of as "an idea which gives shape and structure to the subject, but … is inaccessible to the novice" (Davies, 2006, p. 75).

The view of transformative learner 'journeys' resonates with other perspectives, including Mezirow's notion of transformative learning (2000), Perry's (1970) views on changing epistemological beliefs and Säljö's (1982) conceptions of learning (Cousin, 2008; Entwistle, 2008). The metaphor of the liminal space is comparable to Vygotsky's (1978) zone of proximal development (Cousin, 2008). The broader idea of liminality can be traced to Turner's anthropological work on rites of passage (1969, cited in Land et al., 2008). Insights from psychology are evident in the foregrounding of affective elements of learning, such as learner anxiety, discomfort and "identity work" (Cousin, 2008, p. 264), and students' metalearning capacity (Efklides, 2006; Ward & Meyer, 2010).

The learning journey or transformation encompasses both "intellectual maturation" and "disciplinary enculturation", which are difficult to unravel (Cousin, 2008, p. 263). This conjunction links the TCF strongly to WTP in a discipline (McCune & Hounsell, 2005). The role of the disciplinary context in transforming learner identities fits well with social learning theories and the idea of communities of practice (Cousin, 2008; Lave & Wenger, 1991), where learning is enabled by participation and includes processes of enculturation (Cousin, 2008). The discipline-specific orientation of TC points to the importance of disciplinary discourses and epistemes, or "underlying games" (Perkins, 2006). Pedagogical implications of a TC approach are discipline-based and have an affinity with the notion of signature pedagogies (Shulman, 2005; Zepke, 2013).

[18] The TC view of learning as involving a change in conceptual structure is more in line with Bruner's later work on social views of learning and disciplinary structure, mentioned in Chapter 2.

3.3.2 Wider applications and recent directions

The TCF may also be usefully applied beyond a narrow disciplinary focus inasmuch as "entering studenthood" constitutes a liminal process in itself (Berg et al., 2016; Cousin, 2014, p. 22). This transition requires drawing on reserves of "emotional capital" or experiential knowledge while mastering "rules of engagement" that are often tacit, and may be especially difficult for non-traditional students. For these students in particular, contextual factors significantly influence conceptual mastery, and a supportive learning environment is critical (Cousin, 2014). This view is relevant to the South African higher education context, where it aligns with work relating to epistemological access (Cross et al., 2009; Jacobs, 2007; Frith & Lloyd, 2013). In addition, the TCF has increasingly been applied in new contexts, for instance secondary schooling (Ashwin, 2008), academic literacies and studenthood in higher education (Frith & Lloyd, 2013; Field & Morgan-Klein, 2010), the doctoral research process (Keefer, 2013; Wisker, Kiley & Aiston, 2006), and professional practice (several chapters in Land et al., 2016).

Many early TCF studies in diverse disciplines in higher education set out to identify and interrogate disciplinary TCs and explore their acquisition (Flanagan, 2016; Tight, 2014). More recently, the focus of research has shifted beyond individual disciplines to include "the cognitive processes involved in navigating the liminal spaces of any discipline" in higher education generally (White, Olsen & Schumann, 2016, p. 54).

While liminality (together with its affective connotations) is central to TC learning, this is still the less well understood part of the transformation: "quite what supports or facilitates this passage is not clear" (Rattray, 2016, p. 71). Similarly, Schwartzman (2010, p. 26) points to "lacunae" in representations of student experience within the TCF. She maintains that descriptions of threshold characteristics and of liminality have focused on the aftermath, rather than the experience, of students' learning of challenging concepts, and so have generally not suggested ways of facilitating teaching or supporting students finding difficulty with those concepts. A related, emergent focal area within the TCF considers the psychological and affective characteristics that influence how learners cope with the demands of the learning transition (Berg et al., 2016; Rattray, 2016). Much of this work is still exploratory or theoretical, raising more questions than answers and pointing to areas in need of further research.

3.4 Critiques of the TCF

As the TCF approach has become established, issues and concerns have been identified and developments or revisions suggested (Tight, 2014).

3.4.1 Definition, determination and hegemonic risk

Issues of definition and empirical determination of threshold concepts stem from the claim that Meyer and Land "fail to specify what is essential to a threshold concept" (O'Donnell, 2009; Rowbottom, 2007, p. 263). Qualifiers attach to the five features (listed above) which are commonly understood to define TCs, and critics argue that it is not apparent which or how many of the features are required to designate a "threshold concept" (Wilkinson, 2014), although later work notes that "transformative" is considered the only non-negotiable characteristic (Land, 2013; Land et al., 2010). In considering the diverse disciplinary constructs which have been identified as threshold concepts, Tight questions whether they are all "the same sort of thing" (2014, p. 260). Thus "a common interpretation of what a threshold concept is — and what makes it a threshold concept and for whom — needs to be established" (Barradell, 2013, p. 267). In addition, the likelihood that characteristics such as 'troublesome' or 'transformative' will be experienced differently by individual learners is raised as another shortfall of the TCF (O'Donnell, 2009; Rowbottom, 2007; Wilkinson, 2014).

This line of critique, in assuming that analysis for TCs proceeds from the list of likely features, seems to be based on a misinterpretation of those features as "exacting, … externally-dictated criteria specified by Meyer and Land", which try to "nail down firm parameters for what is actually a rather undomesticable phenomenon" (Morgan, 2015, p. 14). Subsequent work to the original description (e.g. Meyer et al., 2008) has emphasized that the likely features are not a one-size-fits-all checklist asserting that students would all experience the learning of TCs in the same way; on the contrary, it should be obvious that students will vary in their experiences for a range of personal and contextual reasons (J. H. F. Meyer, personal communication, 21 August 2014). Elucidation of aspects of this variation through the learning process is an important facet of much TCF work (Meyer et al., 2008; Townsend, Lu, Hofer & Brunetti, 2015). The framework does not stand or fall on consensual pinning down of specific

disciplinary TCs, or on whether a concept is experienced by each and every learner as 'threshold'. Instead, it offers a particular view on learning — and seeing whether an individual (or group) does experience a concept as transformative is part of the investigation.

The relative extent to which TCs are features of the discipline itself, or of the learner studying it, is an open question: while TCs are clearly more rooted in disciplinary knowledge and practices than some metacognitive constructs (such as learning styles) that are considered personal traits, the troublesome and transformative aspects of this knowledge may be greater for some students than others (Atherton, 2010). Still, TCs remain

> ... disciplinary constructs that have emerged from the crucible of disciplinary scrutiny as definable abstractions agreed upon, at least implicitly, by members of the discipline ... the personal views associated with the concept by members of the discipline will have been jettisoned. (Mead & Gray, 2010, p. 97)

Disciplinary TCs also reflect academics' "knowledge for teaching" which is rooted in and mirrors the knowledge structures of the discipline (Meyer & Timmermans, 2016). "Conferring the status of 'threshold' on a concept may thus be interpreted as a social act by a (bounded) disciplinary community in endorsing *ex cathedra* the transformative conceptual power of the concept" (Meyer & Timmermans, 2016, p. 30).

Related to this account of the identification of disciplinary TCs is the charge that TCs are hegemonic (O'Donnell, 2009; Wilkinson, 2014), in that questions of '*whose* TCs' define the discipline come down to power and control. Thus "whoever controls the dominant narrative decides the threshold concepts"; and since this is "usually majority academic opinion, … any given set of threshold concepts is but a reflection of power and privilege" (Wilkinson, 2014, para. 19–20). The argument follows that the theory of TCs thus "oversimplifies the very real distinctions and difficulties that are inherent in a body of knowledge" (Wilkinson, 2014, para. 21). This issue is of clear relevance to economics, given the dominance of the neoclassical orthodoxy discussed in Chapter 2. Meyer and Land (2006, p. 16) note that the view that TCs might be interpreted as part of a "colonizing" view of the curriculum is not trivial and warrants further consideration.

Cousin (2008, p. 263) observes that TCs are "epistemologically informed", and must therefore be "theorized as provisional, contestable and culturally situated". Furthermore, she points out that the discipline as taught is always imbued with the teacher's epistemological stance — and therefore, we should be aware that students are being inducted into a school of thought, as much as into the subject. Mearman (2013) makes a related point with regard to TCs in economics, arguing that while TCs are dynamic and build intellectual capacity, if they are overly specific, they might narrow students' perspectives by locking them into particular modes of thought; in his view, excessive mathematization in economics presents this danger.

It may be argued that the critique of hegemonic risk conflates the TCF perspective, orientation or view of learning with particular instances of its application. Indeed, the counter view may hold: by virtue of its explication of tacit knowledge and disciplinary rules, a TC orientation "forces us to consider the implications of asking students to look through our disciplinary lens" (Townsend et al., 2015). As explained in Chapter 1, in this study I have focused on students' learning of the existing (neoclassical) microeconomics curriculum, and it was not an objective to trouble the discipline. However, from my own standpoint as a disciplinary teacher, it seems that in exposing implicit rules, assumptions and values, a TC approach can reveal that a given disciplinary perspective — such as neoclassical economics — is exactly that, rather than a universally applicable 'truth'. A TC orientation could equally be used to understand learning or enhance teaching of heterodox economics and might therefore usefully inform the "parallel perspectives" of a pluralist approach (Mearman, 2013), although some of the particular threshold concepts in other schools of economic thought would not match the set in neoclassical economics. These issues suggest that disciplinary teachers need to be reflexive, aware of rival perspectives and concepts, and of their investment in the selection and representation of threshold concepts (Cousin, 2008).

3.4.2 Methodological issues

Methodological concerns directed at the TCF include a purported lack of rigour, consistency and transparency in the diversity of methodological approaches used to date (Barradell, 2013; Quinlan et al., 2013). TC research "does not yet have a fully fledged

research methodology or a strong critical discourse about methodology" (Quinlan et al., 2013, p. 585), and would benefit from more explicit discussion of methodology, including comparison of complementary methods. Calls for more empirical work and innovation in TC research have been made in response to definitional and methodological concerns (Barradell, 2013; Quinlan et al., 2013; Walker, 2013). The relative scarcity of undergraduate student voices in research findings, despite the centrality of questions about student learning to the TCF, has also been flagged (Felten, 2016; White, 2016).

3.4.3 Theoretical status of the TCF

At a broader level, the nature, originality and usefulness of the theory have been questioned. Walker (2013, p. 250) asks whether TC is "a theory which explains empirical observations, or … a concept incorporating and representing several abstract ideas", since the literature supports both conceptions. Tight (2014, p. 260) asks whether "a single theory, idea or framework [can] usefully accommodate such variety" (of disciplinary constructs). Then again, other authors have pointed to the potential of some undeveloped links with complementary theories (Schwartzman, 2010; Walker, 2013). Cousin (2008) addresses the critique that the TCF may be a mere re-packaging of older ideas, pointing out areas of overlap and new perspectives with longer-established theories. In similar vein, Lucas and Mladenovic consider the TCF "a catalyst, drawing together a variety of fields of research in a productive educative framework" (2007, p. 237). Three major contributions of the TC approach (as summed up by Peter & Harlow, 2014) consist in its enabling academics to re-envision teaching and learning by focusing on "what the important ideas are within a discipline, and what it means to be an expert in the field"; in its highlighting of the crucial role in learning of unsettled understanding in the liminal space, and variation in students' reaching understanding of troublesome ideas; and in its drawing attention to interactions between "epistemological (what is learnt and how) and ontological (changes in learners' identity) aspects of learning" (2014, p. 3).

Tight (2014), in his analysis of threshold concepts as a case of theory development in higher education research, concludes that the framework — though not a world-

changing ‘grand theory’ — is useful in generating new and transferable ways of thinking about teaching and learning. It has had a “significant impact” and “has become an established part of thinking about teaching and learning in higher education” (2014, p. 263). In short, while critique exists, the fundamental principles of the TC perspective have not been refuted. If anything, the TCF has considerable latent potential that is still to be realised.

3.5 Application in economics

Economics, as the discipline of origin of the TCF (Meyer & Land, 2003), has been the subject of several TC-oriented studies with diverse emphases and approaches. These include theoretical development of the notion of TCs with regard to economics (Davies & Mangan, 2006a, 2007a); the identification of disciplinary TCs, exploration of students’ experiences of TC learning (including related metalearning), and assessments of the progression of students’ learning (Ashwin, 2008; Davies & Mangan, 2010; Meyer et al., 2009; Reimann & Jackson, 2006; Shanahan, Foster & Meyer, 2006; Shanahan & Meyer, 2006); and pedagogical guidance and exemplars for curriculum redesign (Davies, 2013; Davies & Mangan, 2006a, 2006b; Karunaratne, Breyer & Wood, 2016). Methods used have included interviews of academics and/or students (Davies & Mangan, 2006a, 2007a), student questionnaires (Davies & Mangan, 2007a), and qualitative review of students’ written responses seeking evidence of TC grasp or use (Davies & Mangan, 2007a; Reimann & Jackson, 2006; Shanahan & Meyer, 2006).

3.5.1 Theoretical elaborations

Two elaborations to the idea of threshold concepts have been suggested by Davies and Mangan with regard to economics (2006a, 2007a; and see Davies, 2012). First, they distinguish three types of conceptual change students must undergo in learning economics: basic, discipline threshold and modelling.

Basic concepts can open up the subject by helping students to grasp the economic meanings of issues they had previously only thought of in everyday terms. Examples

include distinguishing the economic use of the terms "price" and "cost", or "savings" versus "investment" — in other words, reworking lay personal understandings of terminology or everyday economic events (noted in Chapter 2 as a potential source of disciplinary difficulty). These are not considered threshold concepts, although they are required for further learning in economics, because they are still atomistic and do not integrate concepts into more complex forms.

Discipline threshold concepts are transformative and integrative, connecting groups of related concepts into a unified higher level concept or theory, for instance opportunity cost, marginal analysis, rationality, or efficiency and welfare. These concepts are overarching, and can transform learners' understandings of other disciplinary ideas with which they are interwoven. However, students are unlikely to comprehend them fully at first, and developing understanding will probably require revisiting these ideas. Discipline thresholds cannot be disentangled from the procedures that are used to generate them — the third category of concepts.

Procedural or **modelling concepts** encompass disciplinary ways of practising and the ability to construct discipline-specific arguments and explanations. Examples include the use of marginal analysis; comparative statics, *ceteris paribus* and equilibrium; elasticity; and time preference.

Procedural and discipline concepts are both considered 'threshold' because of their integrative and transformative effects. Thus while learners need an interim understanding of basic concepts, they will only fully appreciate their significance once their understanding has been transformed by the disciplinary TCs which act as keystones, "bringing robustness and form where previously there was a collection of ideas" (Davies & Mangan, 2006a, p. 7). Crossing these thresholds transforms students' prior learning and knowledge — once they develop an expert understanding of the relevant TCs, the subsidiary parts of the discipline make more sense.

Second, Davies and Mangan (2006a, 2007a) suggest that threshold concepts might best be seen as a web of interconnected concepts which link thinking and practice in the discipline. Understanding a TC may lead learners to re-work not only their understanding of basic concepts they have already incorporated in their thinking, but also their understanding of previously acquired threshold concepts, so that "the more

powerful experiences in a learner's trajectory are likely to involve successively more extensive integration of their thinking" (Davies & Mangan, 2006c, p. 2).

Figure 2 shows a "web" of TCs. It also captures the importance of building students' "sense that they are developing a way of understanding the 'big picture'", which emerged from empirical investigation of students' economic conceptions (Davies & Mangan, 2007a, p. 724). The lines indicating links between TCs are intentionally not drawn as arrows because the relationships may work in either direction. Basic concepts would link into this web, but it is the TCs which provide the structure into which basic concepts are integrated.

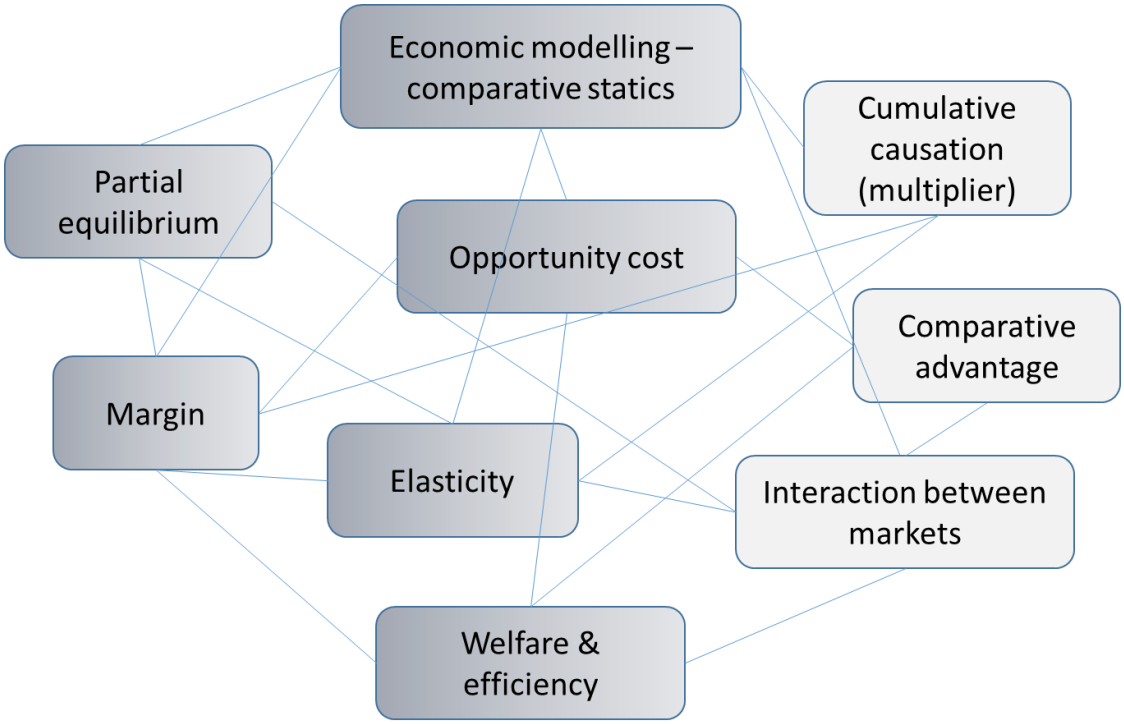

Figure 2. A web of threshold concepts

(adapted from Davies & Mangan, 2007a, p. 722)

3.5.2 Empirical findings

Given the strong disciplinary consensus regarding WTP in economics described in Chapter 2 (Reimann et al., 2005), it is not surprising that within economics education,

the identification of potential TCs — the transformative ideas and procedures one must master in order to progress, as suggested by Davies & Mangan (2007a, 2006a, 2006b) and depicted in Figure 2 — has not been controversial. Within microeconomics, the concepts of opportunity cost and elasticity have received the most attention in empirical studies (see for instance Berg et al., 2016; Meyer et al., 2009; Reimann & Jackson, 2006; Shanahan, 2016; Shanahan et al., 2006; Ward & Meyer, 2010). Nonetheless, authors have avoided putting forward a definitive or exhaustive list of economics TCs, not only because the TC approach is relatively new, but also because its main use is to offer a way of thinking about progression in learning (Davies, 2012). The 'threshold' nature of a concept is epistemologically informed and personally experienced; claiming a definitive list might not only be seen as hegemonic, but could also short-circuit our understanding of the variation in learners' experiences of different concepts.

Using the idea of threshold concepts to explore learning can contribute to our understanding of two problems alluded to in Chapter 2: "students who acquire formal knowledge of a discipline but who seem unable to use this knowledge when making sense of experience outside the classroom, and students who struggle with underpinning theory and resort to verbatim learning of isolated aspects of the subject that they seem unable to use effectively in conjunction" (Davies & Mangan, 2007a, p. 711). Both integrative and transformative properties are emphasised as distinguishing TCs in economics (Davies, 2012; Davies & Mangan, 2007a, 2008), and can be used to unpick students' developing understanding and see their progression in discipline-specific terms. Application is central to students' learning as well as our investigations thereof: the idea of learning as conceptual change does not distinguish between 'understanding' and 'being able to apply', holding instead that "there is *no* understanding *without* making sense of particular examples" (Davies, 2012, p. 251).

Using conceptions of price as an example, three types of integration have been identified (Davies, 2012). A change in *component relations* reflects the kind of change in conception described above and in Chapter 2, from seeing price as the value of an item to comprehending it as the equilibrating outcome of supply and demand interactions. This change could be accompanied by *component reconfiguration*, such as conceiving of supply in a more complex way, considering the shape of the supply curve and incorporating average fixed as well as average variable costs. Finally, when

theoretical re-framing occurs, students are able to "move fluently" from explaining price in terms of representative firms or markets, to thinking about related markets and taking a general equilibrium view (2012, p. 252). Conceptual change that involves both theoretical reframing and component reconfiguration happens when students come to understand TCs such as general equilibrium (Davies, 2012).

Conceptual change can thus entail hard cognitive work. Moreover, transformed understanding is linked to identity, because "learning is more than a matter of thinking; it is also a matter of identification", of being and doing (Davies, 2012, p. 253). In economics, this link is evident in the phrase "thinking like an economist" — a point which aligns with social learning theories such as the idea of a "community of practice" proposed by Lave and Wenger (1991). In learning a subject, and thereby learning to become part of a community, "[t]here are tacit as well as explicit rules and procedures with which a novice needs to become familiar" — for instance, the way in which graphs are used in economics (Davies, 2012, p. 253). Incipient identity shifts are an important part of the learning process — evidence from economics (Davies & Mangan, 2009, cited in Davies, 2012) suggests a strong positive association between students' identification with the discipline and their sense of making progress in their disciplinary learning. These identity shifts may in turn have implications for students' future choices within and beyond their studies (Davies & Guest, 2009).

Following from the significance of this transformation, "the critical question for threshold concepts is the extent to which transformations … depend on the way in which a student's conceptual structure is reorganized around threshold concepts" (Davies, 2012, p. 254). Evidence that TCs do serve to reorganise conceptual structures emerges from a comparison of lecturers' and undergraduate students' written responses to economic problems (Davies & Mangan, 2007a), which found that while students tended to use only one idea to analyse the problem, lecturers referred to several concepts and used a common framework or set of organizing principles to apply these related ideas to the problem, suggesting they had developed a deeper structure of disciplinary knowledge. However, this type of evidence, while indicating that a transition from novice to expert occurs, does not shed light on how this change is effected.

Students' descriptions of critical points in the progress of their understanding in economics provide further insights, and match the idea of a liminal transition suggested by TC theory (Davies & Mangan 2009, cited in Davies, 2012). Some students "were troubled by the way in which teaching had expected them to reconfigure what they thought they already knew (from school) and this had been an alienating experience"; others "described themselves as still in transition knowing they had not yet developed the holistic view that they could see was expected, but still trying to understand. They knew they were not yet insiders but wanted to be. Still others expressed confidence in their understanding and talked about the way they were using this understanding to interpret events reported in newspapers" (Davies, 2012, pp. 254–5).

Realizing the potential help that a TC orientation offers in encouraging students towards deeper approaches to learning requires that teachers identify threshold concepts in a discipline, embed these in the curriculum, and evaluate the results (Davies & Mangan, 2006a) — steps which Davies and Mangan (2006b, 2006c) operationalized in the ETC project. A series of "reflective", "problem-focused" and "threshold network" exercises were developed, in line with design principles arising from the TC view of learning. I used several of these exercises in the series of tutorials that formed part of this study; they are discussed further in Chapter 4, and the exercises are listed in Appendix 5.

3.6 Synthesis: Threshold concepts, learning in economics, and the contributions of this study

Theoretical work in economics has refined the theory of TCs and deepened our understanding of what learning in the discipline requires of students. Empirical studies have used a range of methods to generate an extensive patchwork of evidence that broadly supports the TC view of learning, and gives finer insights into some aspects thereof. Descriptive detail gleaned from student interviews in this body of scholarship matches the central idea of a liminal transition in learning and has to varying degrees highlighted the importance of preconceptions, conceptual change, troublesomeness, identity aspects, and metalearning capacity in disciplinary learning. As far as I can ascertain, these studies have all been based on first-year economics courses in either the UK or Australia.

While the field of TC research has widened hugely since the mid-2000s, the most recent collection of TC papers published (Land et al., 2016) — the fourth volume in a tetralogy published since 2006 — is the first in the series that does not include any economics-specific chapters. Recent TC-oriented work in economics seems to be around pedagogy and curriculum reform (Karunaratne et al., 2016; Shanahan, 2016). This may reflect a sense that the discipline-specific elements of the TCF are sufficiently well developed and empirically supported to allow the focus of TC work in economics to shift towards implementation.

Reflecting back on Chapter 2, the TC perspective speaks to current debates in economics higher education research arising from concerns with the quality of learning: calls for more student-centredness to foster deep approaches and active learning, and critiques of the extensive curriculum. To some extent a TC orientation reconciles the apparent poles of "overstuffed" versus "remedial" curricula (Becker, 2004), and "student-centred" versus "traditional" pedagogy (Colander, 2004). First, TC views of learning suggest that teachers seek out the "jewels" in the curriculum (Land et al., 2006), since initial deeper learning with a narrower focus can ultimately enable more meaningful engagement with a wider range of issues. Second, the TC framework is neither teacher- nor student-centred — TC research has been characterized as "transactional curriculum inquiry", in that it "requires a partnership between subject specialists, educational researchers and learners" (Cousin, 2009, p. 201). As such, TC research embraces both form (pedagogy) and content, in a building process which helps both teachers and students to integrate these aspects in the form of pedagogical content knowledge (Shulman, 1986; Zepke, 2013), or more specifically, "integrated threshold concept knowledge" (ITCK) (Meyer & Timmermans, 2016).

The expansion and evolution of international research using the TCF has led to this suggested notion of ITCK, which aims to translate research findings into theoretically sound, actionable form and bring unity to the approach, while remaining nonprescriptive and adaptive to contexts. ITCK is explained as "knowledge that is empirically based, and socially constructed, at the 'intersection' of specific *transformational* subject content with associated different 'types of knowledge'" (Meyer & Timmermans, 2016, p. 32). This encompasses contributions to knowledge of:

- the critical and possibly troublesome features of TCs;

- how students vary in apprehending and learning TCs, in cognitive, affective and ontological dimensions; and
- the logic and theory underpinning pedagogic responses intended to foster TC learning.

It is into this broadly specified field of ITCK that the findings of this study fits. Exploration of how economics students learn in a threshold concepts-infused programme in the study context shed light on critical features of the TCs (pre-identified and embedded in learning activities, following Davies & Mangan, 2006a, 2006b): findings indicated whether these concepts were experienced as 'threshold' by the participants; which concepts were particularly troublesome or transformative; and what features might make them troublesome, or precipitate liminality and stuckness. My research approach aimed to elicit rich qualitative descriptions of the learning process in the participants' voices, and was thus appropriate for capturing the details of cognitive, affective or ontological aspects of students' encounters with TCs and navigation of the liminal space of learning. The deeper understandings offered by this close-up perspective on their learning may suggest ways in which the process may be supported or facilitated, which will have implications for pedagogic and curricular responses.

While Chapter 2 has noted that aspects of economics curricula are contested, this study takes as given the existing content of introductory and intermediate microeconomics, to look at how students learn what is generally agreed to be the conceptual core of the discipline. Becoming proficient in disciplinary ways of thinking is a complicated process, involving the individual in interactions with the nature of the discipline, teaching approaches, course content, and broader contextual features. Given that economics is often experienced as difficult by undergraduate students, it seems likely that emotion may feature in the process of disciplinary learning; however, emotional aspects are neglected by most research in economics education. The entwining of learning and identity is similarly overlooked, despite being implicit in the aspirational phrase "to think like an economist".

In contrast to much research on teaching and learning in economics, the TCF takes a more holistic view of learning: it focuses on interrogating sources of difficulty, and views conceptual learning as traversing a liminal phase, involving both affective and cognitive elements, and resulting in ontological and epistemological transformation for

the learner. While this perspective is well established in research into learning in economics internationally, particularly in the UK and Australia, it has not been explored in the discipline in South Africa, where research has focused predominantly on quantitative studies of performance determinants and (to a lesser extent) teaching innovations. The TCF suggests some different questions, as well as different ways of answering them, which yield new insights into undergraduates' learning of economics here.

In this study, I set out to explore how (and why) economics students learn in a threshold concepts-infused higher education learning programme. In using a threshold concepts orientation here, I hoped to address both conceptual and contextual gaps. With regard to the first, because the study focuses on processes and experiences of students' learning, and indicates possible ways to support and facilitate learning transitions, it is located within the "lacunae" of the TCF to which Schwartzman (2010) has pointed, and sheds further light on the less understood, liminal aspects of disciplinary learning in terms of TC theory (Land, 2013; Rattray, 2016). This work also addresses a clear contextual gap in South Africa, where research in economics higher education encompasses a narrower range of approaches and issues than those in evidence in the international literature: little qualitative or conceptual enquiry has been undertaken, and understanding of how students learn in economics or related disciplines in South African higher education remains superficial (Ojo, 2012). The setting of the case study within a level 2 (second-year, intermediate) context is also novel, since empirical work on threshold concepts has concentrated on level 1 (first-year, principles) courses. This generates possible insights into learners' progress in crossing thresholds to studenthood (Berg et al., 2016; Cousin, 2006), and in mastering the intended basic and threshold concepts taught in level 1 economics (Davies, 2012; Davies & Mangan, 2006a, 2007a).

A further contribution of this study lies in the foregrounding of students' voices to answer the research questions. This approach is rare in economics education research, which is almost exclusively from the perspective of academics (Colander & McGoldrick, 2009). Within threshold concepts scholarship, questions of student learning are central to the framework, and using student voice-data is increasingly recognized as an effective way of exploring cognitive, affective, and identity-related dimensions of learning (Meyer & Timmermans, 2016; Peter & Harlow, 2014).

Nonetheless, undergraduate student voices have to date been largely absent from the conversation; and to the extent that such data are used within the TCF, students are usually "objects of study", rather than "partners" in enquiry (Felten, 2016, p. 3). In this study, students are cast in the latter role and are crucially involved in initial analysis, according to IQA methodology (discussed more fully in the following chapter).

3.7 Concluding comments

The TCF offers a promising lens through which to view disciplinary learning. Its explicit recognition of difficulty, and of the interlacing of affective and identity-related dimensions with the cognitive aspects of learning, suggests it may be able to sketch possible answers to questions not usually asked in economics education research (and to date, neglected in South African contributions to this area), about the processes and experiences of students' learning in economics, and how they might be supported. A TC-orientation infused the approach I followed in the tutorial programme through which I explored students' learning, because it was inherent in the activities that structured students' interactions in the tutorials (Davies & Mangan, 2006c). The methodology I used generated insights directly from students, in this context, where to date most of our formal, research-informed qualitative understanding of how students learn in economics has been based on international experience as speculated about by academics and educational researchers. The students' perspectives allowed me to consider the extent to which their experiences align with the TCF, pointed to important elements of their learning that are overlooked in theory or practice, and indicated how learning could be facilitated. The following chapter details the research methodology I used to generate those perspectives.

CHAPTER 4
RESEARCH METHODOLOGY: THE TC-INFUSED LEARNING PROGRAMME AND INTERACTIVE QUALITATIVE ANALYSIS

4.1 Introduction

The previous two chapters reviewed existing research around teaching and learning in economics, and discussed the theory of threshold concepts that frames the study. This chapter describes the research approach I followed in seeking to deepen the understanding of economics students' learning. Sections 4.2 and 4.3 consider the relevance of a qualitative, interpretive approach and a case study research design, and describe the research site and selection of participants for this study. Section 4.4 explains the TC-infused tutorial programme. In section 4.5, I describe the processes of IQA (Northcutt & McCoy, 2004), which I used to generate and analyze data. Data sources comprised the two phases of IQA — focus groups and in-depth interviews — supplemented by participants' reflective writing. Issues of rigour and ethics are considered in sections 4.6 and 4.7. I offer some methodological reflections in section 4.8, and concluding comments in 4.9. The data generated by means of this methodology will be described in Chapters 5–8, with Chapter 5 offering further elaboration on the functioning of the focus group and analysis protocols, and Chapters 6–8 describing the interview data.

4.2 Qualitative research

The intention in qualitative research is to gain an in-depth, holistic understanding of the phenomenon being studied, through exploring "the meaning individuals or groups ascribe to a social or human problem" (Creswell, 2013, p. 44). Qualitative research thus entails an interpretive, naturalistic approach, in which phenomena are studied in their natural settings and interpreted in terms of the meanings people bring to them (Denzin & Lincoln, 2011). This approach is grounded in the view that "the social world can only

be understood from the standpoint of the individuals who are part of the ongoing action being investigated", and that an "understanding of individuals' interpretations of the world around them has to come from the inside, not the outside" (Cohen et al., 2011, p. 15). Participants themselves thus define the social reality, which must be examined from their perspectives and not that of the researcher.

Because situations and events are subject to multiple interpretations and perspectives, and reality is complex and multi-layered, many phenomena cannot be reduced to simplistic interpretations. A qualitative approach thus requires "thick descriptions representing the complexity of situations" (Cohen et al., 2011, p. 17; Geertz, 1973). The defining features of this qualitative, interpretive approach are distilled by Terre Blanche, Durrheim and Painter (2006, p. 7):

> The interpretive paradigm involves taking seriously people's subjective experiences as the essence of what is real for them (ontology), making sense of people's experiences by interacting with them and listening carefully to what they tell us (epistemology), and making use of qualitative research techniques to collect and analyse information (methodology).

Qualitative research is congruent with the principles of social constructivism, in terms of which truth is seen as relative and dependent on one's perspective, meaning is subjectively created, and reality is socially constructed (Baxter & Jack, 2008). This perspective clearly resonates with my study. The TCF, which frames the study, falls within a social constructivist orientation (Land et al., 2008): the role of learners in constructing their knowledge is crucial and cannot be considered separately from their social context. The essential features of threshold concepts — their transformative, integrative, troublesome aspects — are defined from the learners' perspective. In line with this, the description of TC research as "transactional curriculum enquiry" (Cousin, 2008) emphasizes the importance of the learners' viewpoint for those hoping to understand the nature of learning, sources of difficulty, and factors influencing how the learning process transpires. Moreover, the nature of the data generated by qualitative research — thick, rich descriptions derived in a real context — matches the requirements of the critical questions, which seek a deep understanding of students' learning in a particular context. Thus it was clear the study would be best served by a qualitative approach.

4.3 Case study research design

Within this approach, a case study research design seemed most appropriate for generating in-depth understanding through rich, contextualized descriptions. A case study is "a systematic and in-depth investigation of a particular instance in its context in order to generate knowledge" (Rule & John, 2011, p. 4). Case study research design supports the principles of qualitative research, social constructivism, and the ideology implicit in the TCF as described above. In line with these perspectives, a strength of the case study approach is the close collaboration occasioned between the researcher and participants, whereby participants describe their views of reality and thus enable the researcher to better understand their actions (Baxter & Jack, 2008).

According to Yin (2009), the case study is considered a fitting research design when the research questions are largely explanatory (focusing on how and why the phenomenon manifests); when the investigator does not control behaviour; when the focus is on a contemporary set of events; and when contextual conditions are believed to be relevant to the phenomenon. Case studies can be used for various purposes, of which the following are relevant to this study:

- to generate an understanding of and insight into a particular instance through rich description and illuminating its relations to broader contexts;
- to explore a general issue within a limited and focused setting;
- to generate theoretical insights or develop and test existing theory;
- to shed light on similar cases and provide a level of generalization or transferability. (Rule & John, 2011, p. 7)

Different ways of categorizing case studies have been proposed. This study most closely matches Yin's (2009) "explanatory" category, in that it aims to explain what happened in a particular case and why it happened (Rule &, John 2011; Yin, 2009). This study also resonates with two categories proposed by Stake (1994): the intrinsic case study, where the case itself is of interest as a particular situation worth understanding more fully; and the instrumental case study, which is examined in order to gain insight into a focal issue or theory (Cohen et al., 2011; Rule & John, 2011).

A possible advantage of case studies that may especially appeal to educational researchers is that — although distinct from action research — case studies can be seen

as “a step to action”, in that they “begin in a world of action and contribute to it. Their insights may be directly interpreted and put to use; for staff and individual development, for within-institutional feedback; for formative evaluation …” (Cohen et al., 2011, p. 292). This reflects my own professional interest in my research topic.

The criticism is sometimes made that case studies, being idiographic, have limited generalizability (Rule & John, 2011; Silverman, 2011). However, case studies can arguably allow for analytic generalizability (as opposed to statistical generalizability, which requires a representative sample from which findings may be extrapolated to the population). Analytic generalizability refers to a case’s ability to contribute to the expansion and generalization of theory (Yin, 2009), which can enhance researchers’ understanding of similar cases, phenomena or situations — “there is a logical rather than statistical connection between the case and the wider theory” (Cohen et al., 2011, p. 294). Thus it is possible that findings from my case study, though particular to its context, could have wider resonance. Nonetheless, the intention is not to make claims beyond the case. My choice of methodology was guided by the “fit for purpose” principle — it was “a considered choice to study the singular with the explicit intention of gaining understanding of the particularity of the case” (Rule & John, 2011, p. 105).

4.3.1 Research site and context

My study was conducted at the University of KwaZulu-Natal (UKZN), South Africa. UKZN was formed on 1 January 2004, following a merger between the University of Natal and the University of Durban-Westville. The university has a diverse student and staff population, and offers qualifications in a wide range of academic disciplines on five campuses. The study was based in the Intermediate Microeconomics and Applications (Econ 202) module, on UKZN’s Pietermaritzburg campus.

Econ 202 is a one-semester, second-year module, which is compulsory in the BCom and BCom (Accounting) degrees, and is a prerequisite for a major in Economics in the BCom, BA, BSocSc and BSc degrees. It is an elective for non-Economics majors in the BA, BSocSc and BSc degrees. The class size is about 350 on the Pietermaritzburg campus, and teaching takes the form of four weekly plenary lectures, complemented by

double-period ‘workshops’ (focused on problem sets and facilitated by postgraduate tutors) every two to three weeks over the semester.

Microeconomics — the concepts and principles it encompasses, the tools and techniques it provides — can be seen as the cornerstone of an economic way of thinking and of analyzing real-world issues. Econ 202, a standard intermediate microeconomics course using a popular international text and comparable in terms of topic coverage to equivalent courses the world over, is intended to consolidate and build on the microeconomics principles that students encounter in their first year of economics study. Criticisms, extensions, and applications of theory are introduced in this module. This requires a deep approach to learning, so that students can begin to develop overarching organizing frameworks to integrate the principles they learn. Thus “the task of intermediate microeconomics … is to help students organize algorithmic tools into a conceptual framework that helps them recognize which real-world situations call for which theories and tools” (Green et al., 2013, p. 146). Intermediate Microeconomics was accordingly an appropriate module in which to investigate students’ learning of disciplinary threshold concepts. It is also a module I have taught for several years, so I am familiar with the content and know which areas students find particularly troublesome.

4.3.2 Selection of participants

Participants were drawn from Econ 202 students who volunteered to take part in the study. At an information session early in the semester, I explained to the Econ 202 class what participation in the study would require of them: regular attendance at tutorials which I (as their lecturer) would facilitate, and completion of the set assignments; participation in the IQA focus groups and in-depth interviews towards the end of the module; maintenance of reflective learning journals; and agreement to allow me to use their written reflections for research purposes. Interested students were asked to complete a short application giving some biographic and academic background, written answers to a descriptive question on their understanding of what economics entails, and a brief written motivation.

I had anticipated that there would be sufficient volunteers for me to select a sample, because this module is a prerequisite for degree progression for most students, and (from experience with the same module) I expected that many would take up opportunities perceived as potentially beneficial to their performance. From the application responses, I intended to select a purposive sample of 20 participants. In purposive sampling, the researcher deliberately chooses participants on the basis of a judgement of their 'typicality', or of their possession of particular characteristics of interest (Cohen et al., 2011). The sample is not intended to be statistically representative, or to yield generalizable findings (Silverman, 2011). It is instead "deliberately and unashamedly selective and biased" (Cohen et al., 2011, p. 157), consisting of handpicked "people who can shed the most light, or different lights, on a case" (Rule & John, 2011, p. 64).

I aimed to have a sample size of 20, because these participants would comprise the tutorial group through the semester, as well as the focus group for the IQA conducted near the end of the module. A class size of 20 is considered appropriate for small-group teaching (Bargate, 2012), and a group size of 20 coincides with Northcutt and McCoy's (2004) recommendation of 12–20 participants in an IQA focus group. In all, 30 people applied to take part in the study. Five had timetable clashes that would preclude them from attending the tutorials. I decided to invite all of the remaining 25 to participate, to allow for some attrition. At the first meeting, 28 students arrived (three having rearranged their timetables to accommodate the tutorials). Over the course of the semester (nine tutorials) this number diminished somewhat to a core of 21 regular participants, of whom 20 participated in the focus group sessions and interviews.

While the sample was not intended to be statistically representative, the group of participants reflected broad variation in terms of gender, ethnicity and home language, and academic record. Of the original 28 participants, 13 were female and 15 male; seven male students stopped attending the tutorials over the semester, leaving 13 females and eight males to participate in the IQA focus group and interviews. The ethnic composition of the initial 28 was 26 South African students (of whom 23 were African, one Indian and two white), one Zimbabwean and one Congolese student. The final grouping comprised 19 South African students (18 African and one Indian), the Zimbabwean student and the Congolese student. Initially, five repeat students attended,

but two of these stopped attending, leaving three repeat students in the final group. Of the final group, two indicated English as their home language; two chose both Zulu and English; and 14 were second- or third-language English speakers. Twelve were BCom students, two BCom (Accounting), three BA, and four BSocSc. Fourteen students intended to major in Economics, and seven did not plan to continue with Economics beyond second year.

4.4 The threshold concepts-infused tutorial programme

To enable me to study economics students' learning, I designed a tutorial programme informed by a TC orientation, which ran alongside mainstream lectures for most of the semester. This aligns with the idea of the "arranged situation" (Naidoo & Vithal, 2014), in that it allowed me to use active, cooperative learning pedagogies not available in the current mainstream situation, but established in theoretical and empirical work as conducive to learning. Less formally, this could be likened to a greenhouse which sought to offer optimal conditions for growth, in order to study the processes involved in that growth (and not primarily to test the conditions). The programme comprised two aspects — weekly tutorials, and written reflections — described further below. Opportunities for students to reflect on the process of learning for themselves were built into the programme through both of these components. Through facilitating the tutorials, I was able to engage closely with the participants over the semester, and I believe the relationship I formed with the group facilitated subsequent processes of data generation.

4.4.1 Tutorial format and activities

The weekly 90-minute sessions came to be known as the "TC tuts". Each tutorial focused on specific threshold concepts embedded in topics which form part of the Econ 202 module content.[19] I attempted to align the timing of topics or concept coverage in the tutorials broadly with the mainstream lectures, so that the relevance of these additional sessions would be clear to the participants.

[19] A schedule of topics is included in Appendix 5.

In the tutorial sessions, I strived to create an informal, relaxed environment where students could interact comfortably with each other to discuss the tasks and to share and develop their economic knowledge. I aimed to facilitate rather than 'teach' the material, and the bulk of class time was taken up by small-group discussion, with participants working in groups of four to six. I assigned students randomly to groups each week, to avoid having people sit repeatedly with the same friends and to ensure that all participants would interact and get to know each other over the semester. As expected, despite some initial reluctance from a few students, this practice promoted the rapid establishment of group cohesion and identity (Bargate, 2012).

Each tutorial was structured around an exercise focused on real-world or 'everyday' application of specific threshold concepts. The tasks required extensive group discussion, some written components, report-back from the groups in a class plenary with further discussion and feedback, and reflection (post-exercise in the tutorial and/or later in their reflective writing). Most of the tasks were drawn from the ETC teaching and learning activities referred to in Chapter 3, which were developed by Davies and Mangan (2006c) and their colleagues, and are freely available on the ETC website.[20] The ETC activities strongly complemented the cooperative pedagogical approach I used in the tutorials, although the activities do not prescribe group discussion and could be undertaken individually. I selected seven of the 12 microeconomics exercises on the website (some of which I adapted slightly, for instance by using local examples), and designed two further tutorial exercises based on classroom games (Hazlett, 1997), followed by discussion questions and feedback in line with the principles informing the ETC activities.

The ETC activities are connected to the introductory level syllabus in the UK, but the ones I selected covered topics revisited in Econ 202. All participants had encountered the embedded concepts before in their first year of economics, albeit with varying degrees of understanding. The exercises were therefore intended to cause them to draw on and apply this conceptual knowledge. Davies and Mangan (2006c) highlight the flexibility with which their exercises may be incorporated into teaching and learning programmes, insisting only on the importance of completing all stages of an exercise, since each stage leads to the next, which I made sure to do within the tutorials.

[20] http://www.staffs.ac.uk/schools/business/iepr/etc/index.htm

The design of the ETC teaching and learning activities was guided by a TC orientation: "Our work has centred on how to get students 'thinking like an economist' rather than simply being able to regurgitate concepts and models … in an isolated fashion when given directed signals" (Davies & Mangan, 2006c, p. 1). The exercises are intended to encourage active learning, using a variety of relatable topics that engage students' interest. Each exercise embeds thresholds concepts in the case or example that students are guided to analyze. Given the view of disciplinary threshold concepts as comprising a web that links theory and practice (Davies & Mangan, 2006a), the exercises do not focus solely on one concept each but aim instead to "draw the students' attention to where these concepts are used as a way of developing their understanding of the conceptual framework within which economists operate", while also allowing them to "revisit other previously introduced concepts within different applications and appreciate the patterns of thought within the discipline" (Davies & Mangan, 2006c, p. 3).

Attendance was voluntary, and attendance numbers ranged from an initial maximum of 28 to as few as 10 students (the latter in a week heavy with rescheduled tests in several subjects, following disruptive student protests). On average, the tutorials were consistently attended by a core of about 20 students who stayed the course and participated in the focus group sessions and individual interviews at the end of the semester. I sent weekly email reminders outlining the topic for the upcoming tutorial, and did not censure students who missed sessions. Where the tutorials called for written answers to tasks, I did not take these in for assessment purposes. Attendance and participation thus relied on the motivation and goodwill of the students in the group.

4.4.2 Written reflections

Each week, as a form of homework, I asked the participating students to write in their journals, recording and reflecting on their experiences of learning economics. I expected that this activity would have intrinsic value for the students, in that it could enhance their self-understanding and sense of control over the learning process, or their metalearning (Bargate, 2012; Moon, 1999; Ward & Meyer, 2010). At the same time, these journals were an additional source of data for my study (Creswell, 2013).

Reflective journals have been suggested as an apt means of researching disciplinary threshold concepts, because they may offer insights into the transformative, integrative shifts in knowledge, and possibly identity, which learning threshold concepts entails (Davies, 2006). Studies of learning in economics have made use of reflective writing by students (e.g. Brewer & Josefowicz, 2006; Olmsted & Ruediger, 2013), but this has typically been introduced as an end (or intervention) in itself, with a primary focus on drawing students' attention to the relevance of economic principles to daily life, rather than focusing on the learning process per se or acting as a source of data. In a closely aligned field, Bargate (2012) used reflective journals for supplementary data and triangulation of IQA findings in her study of student experiences of learning in the discipline of accounting at UKZN. My study followed a similar approach, using students' reflective writing to supplement IQA focus group and individual interview data.

Participants in my study chose between writing their reflections longhand (in notebooks I provided), or electronically (in the form of a weekly email or an ongoing Word document sent to me). The group split evenly across the two formats. I suggested questions or prompts[21] (Moon, 1999) for each week's reflections, which encompassed both tutorial- and content-specific responses and more general insights. I asked participants to submit their written reflections to me on the Monday of the tutorial week, to allow me time to read and respond to their writing before the tutorial on Wednesday. Most did not submit on time, but given the small number (not all of whom submitted regularly) I was able to read and write individual responses to each submission every week. Because completion of the reflections was not compulsory and had no impact on assessment, I was reliant on the participants' goodwill and interest. I expressed my appreciation for their submissions, and frequently emphasized their importance to my research, reminding the group weekly to submit their reflections and accepting late submissions gratefully. I believe the individual comments I wrote in response to each submission underscored the value I placed on their reflections and encouraged many of the participants to reflect more deeply on their learning. The rate of submissions varied each week, declining slightly over the course of the programme. Students submitted on average between five and six of the nine entries; two students submitted every week without fail, two submitted no reflections at all, and several gave me a few weeks'

[21] These prompts are included in Appendix 6.

worth in a batch towards the end. Some were cursory, limited to a few lines, while others sent more detailed responses of several paragraphs. Handwritten submissions were scanned and later transcribed verbatim prior to analysis; electronic submissions were retained as submitted.

The reflective writing offered additional perspectives on students' learning in economics, and thus served as a source of data triangulation, allowing for fuller explanations and enhancing confidence in the focus group and interview findings (Cohen et al., 2011; Guba, 1981).

4.5 Data generation and analysis

I derived data from the two phases of IQA — focus groups and in-depth interviews — and from students' reflective writing. Qualitative data analysis is "distinguished by its merging of analysis and interpretation and often by the merging of data collection with data analysis" (Cohen et al., 2011, p. 537). Such merging of data generation, analysis and interpretation is reflected in the application of IQA in my study.

4.5.1 Interactive Qualitative Analysis (IQA)

I used IQA — a qualitative research method developed by Northcutt and McCoy (2004) — to explore and represent economics students' learning in the TC-infused tutorial programme. IQA uses a "systematic, protocol-driven research procedure … [that] provides the quantitative rigor of algorithmically generated data analysis, combined with the qualitative descriptiveness of interviews" (Winston, 2011, p. viii). The method involves using focus groups to generate "affinities" (themes), which are in turn used to construct a unified, descriptive system diagram to illustrate the phenomenon. The IQA method is founded in systems theory, and is congruent with a social constructivist approach to data generation and analysis (Bargate, 2012). In seeking to understand a phenomenon as a system, the generic research questions posed in IQA are:

- What are the elements or components of meaning of the system?

- How do these relate to each other in a perceptual system of cause and effect? (Northcutt & McCoy, 2004).

IQA is distinct from more traditional forms of qualitative enquiry in that it refutes the idea of the researcher as the expert who must interpret data, and instead entrusts participants with the analysis and interpretation of the data they generate (Tabane, 2010). This aligns with the tenets of social constructivist research in that it relies on the views expressed by participants in a natural setting who construct their own meaning of reality from their experiences of engaging with the phenomenon in context. The array of meanings from the participants provides the researcher with a nuanced and complex view of the phenomenon.

IQA is a novel method, which has not been used in economics education research, as far as I can determine. In South Africa, IQA methodology has been applied primarily in the field of educational psychology (Human-Vogel, 2006; Human-Vogel & Mahlangu, 2009; Mampana & Bouwer, 2011; Tabane, 2010). Bargate (2012) applied IQA in a context similar to that of my study, in her enquiry into students' experiences of learning in an accounting discipline (Managerial Accounting and Finance) at UKZN.

As far as I am aware IQA has not previously been applied in threshold concepts-oriented studies. Yet the approach clearly resonates strongly with threshold concepts research, which is characterized as "transactional curriculum inquiry" in which academics, students and educationalists work iteratively together to explore the difficulty of the subject (Cousin, 2008, 2009). TC research thus avoids the "interpretive dilemma" often associated with phenomenographic approaches: the concern that "inescapably, this form of student experience research can be read as the researcher's experience of the student experience" (Cousin, 2008, p. 267). Likewise, in IQA a significant advantage of engaging the participants in generating, analyzing and interpreting data is that it minimizes the hazards of power relations and bias often inherent in qualitative research (Northcutt & McCoy, 2004), and reduces concerns around trustworthiness, dependability and confirmability (Tabane, 2010). The question of rigour will be considered with regard to this study in section 4.6.

4.5.2 Ontological and epistemological stance of IQA

The philosophical assumptions of IQA shaped how I sought information to answer my research questions (Creswell, 2013), as reflected in the research method and design of this study. The ideological dimensions — the "beliefs and values" of IQA — are captured in a series of points by Northcutt and McCoy (2004, pp. 16–17), which I briefly explain and relate to my study in the following paragraphs.

"IQA presumes that knowledge and power are largely dependent" (Northcutt & McCoy, 2004, p. 16). This is reflected in the identification of "constituencies" — in other words, the selection of (research) participants — the first criterion for which is the degree of power they have over the phenomenon to be investigated. In my study, the power over the phenomenon — their own learning — rested with the students who participated in the tutorial programme.

"IQA presumes that the observer and the observed are dependent (or… interdependent)" (Northcutt & McCoy, 2004, p. 16). The methods of data generation and analysis in IQA disrupt the assumptions that data collection and analysis are distinct, and that only the researcher is qualified to do the latter. As elaborated below, in IQA participants generate and begin to interpret their own data, while the role of the researcher in these initial processes is primarily facilitative.

"The object of research in IQA is clearly reality in consciousness" (Northcutt & McCoy, 2004, p. 16). Since reality is seen as multiple and subjective, the second criterion for the selection of research participants is their proximity to the phenomenon. The focus group processes generate insights into a socially constructed reality, as related by the participants; the individual interviews are intended to elaborate individual meanings of the components of reality. Again, the participants in the tutorial programme were closest to, and therefore best placed to construct and represent, their learning of economics.

"IQA insists that both deduction and induction are necessary to the investigation of meaning" (Northcutt & McCoy, 2004, p. 16). In the focus groups, participants generate categories of meaning using induction, define and refine these categories using both induction and deduction, and identify relationships of influence among them

deductively. These three stages of IQA correspond to emergent, axial and theoretical coding processes often distinguished in qualitative analysis (2004, p. 17).

"IQA contends that decontextualized descriptions are useful and possible… as long as they are backed up… by highly contextualized ones" (Northcutt & McCoy, 2004, p. 17). The researcher is responsible for providing some larger context within which the reader may understand the representations of participants' meanings. I have endeavoured to do this by situating the study findings within the broader sweep of economics education research, the threshold concepts view of learning, and the immediate context of the case study, within this chapter and the preceding two chapters.

"IQA is clearly favorable to theory, both from the point of view of inducing theory and of testing it" (Northcutt & McCoy, 2004, p. 17). The product of IQA is a representation of a group or individual mind map — a "theory in perception" for the group (or individual) with regard to the phenomenon (2004, p. 17). This representation is grounded in the reality of the participants — those closest to the phenomenon — but may be usefully related to existing theory, to test, confirm or extend more broadly the established understandings. In Chapter 9 of this study I discuss the findings which emerge from participants' portrayals of their learning in relation to extant work in economics education research and threshold concepts theory.

4.5.3 IQA processes

The main processes of IQA will be outlined here in general terms; details of the implementation of the focus group and application of IQA protocols for the study are reported in Chapter 5.

4.5.3.1 Focus groups: Group reality

The first phase of IQA is initiated in a focus group where participants[22] (or "constituents", the term used by Northcutt and McCoy) generate responses relating to the phenomenon under study. In line with the fundamental tenet that reality or meaning is socially constructed, the criteria for the selection of constituents are i) distance, or the extent to which they directly experience the phenomenon, and ii) the extent to which they have power over the phenomenon (Northcutt & McCoy, 2004, p. 66). The participants themselves then undertake data analysis, first by clustering their responses into emergent themes or "affinities", and then specifying the relationships of influence among the affinities, using an Affinity Relationship Table (ART). The product of this phase of the IQA process is a Systems Influence Diagram (SID), which is "a visual representation of a phenomenon prepared according to rigorous and replicable rules for the purpose of achieving complexity, simplicity, comprehensiveness, and interpretability" (Northcutt & McCoy, 2004, p. 41).

Focus groups are recognized as a useful means of qualitative data collection (Cohen et al., 2011; Creswell, 2013). The conduct of an IQA focus group differs substantially from standard focus groups, in that the prescribed format does not centre on verbal discussion, and the recommended group size is therefore larger than the four to 12 participants suggested in traditional versions (Cohen et al., 2011). Northcutt and McCoy (2004) suggest 12–20 group members as the ideal size to ensure a large enough pool of responses and to reduce the possibility of bias being introduced by domineering personalities during the coding phase.

The purpose of the IQA focus group phase is to "capture the perception of a phenomenon by a group of people who all have something important in common vis-à-vis the phenomenon" (Northcutt & McCoy, 2004, p. 85). In my study, the focus group sessions were intended to generate responses that would capture a common perspective and shed light on the participants' learning in the TC-infused tutorial programme. My role as researcher during the focus group sessions was to facilitate the process by guiding the group through the procedures, being careful to set aside my own possible

[22] While noting the aptness of the power connotations in "constituents", I have chosen to use the term "participants", in line with the convention in qualitative research, and because it reflects students' participation in the tutorial programme over the semester as well as the focus groups.

preconceptions of the phenomenon of students' learning in the programme and avoiding imposing my interpretations of the emergent data.

Northcutt and McCoy (2004) suggest using guided imagery in a warm-up exercise to help participants to clear their minds. Participants are then presented with issue statements, which are designed to generate answers to the research question. A silent brainstorming phase follows, as participants engage with the issue statements and record all of their individual (spontaneous and uncensored) responses on index cards, writing one thought or experience per card, using words, phrases, sentences or pictures. The advantages of a silent brainstorming process over the standard focus group include participants being able to generate a large volume of data without distractions from other group members, and the group being unlikely to be influenced or intimidated by dominant participants, or to become mired in a single train of thought (Smithson, 2000). A possible drawback is that some participants may require conversation to prompt their thinking, which this format does not accommodate (Bargate, 2012). After the brainstorming — typically about 15 minutes — the index cards are affixed randomly to a wall.

The clarification stage follows: the researcher reads each card aloud to ensure that all participants understand its meaning, which lays the foundation for constructing a shared reality among members. Then, the group is asked to silently organize the cards into groups of meaning, or themes, which will be known as affinities; Northcutt and McCoy (2004) refer to this clustering as inductive coding. Again, the silent nature of this process is intended to ensure it is not dominated by the views of strong personalities or the researcher (Bargate, 2012). The subsequent axial coding is a deductive process in which participants as a group give a name to each cluster of responses (affinity naming), and any cards that may have been miscategorized are reassigned to the appropriate affinity. The responses comprising each affinity are written up into a consolidated description articulating the meaning of that affinity for the group, grounded in specific responses or examples.

Theoretical coding is then undertaken. The participants identify relationships of influence between pairs of affinities, which are recorded on an ART. For any pair of affinities (A and B), three relations of influence are possible: A influences B (A → B), B influences A (A ← B), or no relationship exists. Participants are asked to indicate

how they see the directionality, and to give a short, specific example of the relationship in their experience, in everyday language, or as an 'if… then' hypothesis). Participants thus begin to theorize about how the elements of the phenomenon interrelate. The goal of this stage is "to identify the skeleton of a 'theory in perception'" (Northcutt & McCoy, 2004, p. 48).

IQA allows for various protocols to derive a composite Interrelationship Diagram (IRD) for the group from the ARTs, and prescribes certain steps proceeding from the IRD to produce the SID. My use of these procedures to arrive at the visual representation of the focus group's construction of their reality is detailed in Chapter 5.

4.5.3.2 Semi-structured interviews: Individual reality

The second phase of IQA typically comprises in-depth, semi-structured individual interviews. These are intended to add richness and depth to the descriptions of meaning of the affinities emerging from the focus group process (Northcutt & McCoy, 2004). Thus the interview phase is not an entirely new round of data collection, but "represents a deeper analysis, by the participants", of the findings of the focus group (Tabane, 2010, p. 84). The interview protocol is only drafted after the focus group and ART phase, since the questions emerge from the affinities described by participants in the first phase.

Individual interviews offer the advantages of depth, comprehensiveness and flexibility in allowing the researcher access to individual understandings (Cohen et al., 2011; Creswell, 2013). Interviews reflect a view of knowledge as being generated by social interaction, which is consistent with the overall stance of this study, and highlights the importance of reflecting on the relationship between interviewer and interviewee (Kvale & Brinkmann, 2009). In this case study, the possibility of bias arises from the power relationship between the interviewer and participants (Creswell, 2013), since I was the participants' lecturer, which may have inclined some towards answers they perceived as more acceptable to me. To mitigate this possibility, I reminded them of the purpose of my research at the outset, and assured them that honesty was preferable. It is also likely that the less formal, trusting relationship established between us over the semester would help to reduce the impact of the power imbalance. Moreover, the structuring of

the interviews around the affinities — which were generated by the participants as a group, rather than by me as the researcher — could be expected to increase their perceived power over the course of the interview.

I developed an interview protocol (Appendix 10) from the six affinities identified by the focus group, and conducted individual interviews soon after the second focus group session. I interviewed 20 students who had stayed the course and attended the tutorials for the duration of the semester. Each interview followed a similar pattern, in which I asked the participant to reflect on the personal meaning of each affinity in turn, and on the relationships of influence among the affinities. The interviews were broadly structured by the affinities, although individual emphases differed. To maintain a conversational tone and momentum, I allowed the order of discussion of the affinities to proceed naturally as one topic led to the next, while ensuring each was elaborated (Northcutt & McCoy, 2004). Most interviews lasted between 25 and 40 minutes, and all were audio-recorded and later transcribed by me.

4.5.3.3 Data analysis

As described above, (initial) analysis and interpretation is merged with data generation in IQA. My use of IQA protocols to arrive at the SID — the outcome of the focus group stage — is explained with reference to the specifics of the study in the following chapter. This section will explain (further) analysis of the interview transcripts in terms of IQA — a process I also applied in analyzing participants' reflective writing.

The affinities generated by the focus group and elaborated in the individual interviews provide the basis for coding the interview transcripts and (for the purposes of my study) the participants' reflective writing. In coding the latter, I was alert to the possibility that some of the issues arising from this supplementary data stream might not fit neatly into the affinity categories. However, the preponderant themes in participants' reflective writing were all accommodated within the affinities.

I examined the transcripts and reflections, beginning with axial coding and following IQA guidelines to combine axial data — "specific examples of discourse that illustrate or allude to an affinity" (Northcutt & McCoy, 2004, p. 315) — from all of the sources

into a composite table per affinity (with identifiers that would enable me to distinguish participant and transcript line at a later stage, if necessary). From the composite table, I identified recurring themes (Bargate, 2012) reflected in sub-groups of quotes within each affinity. I followed the same process for theoretical coding, for which I used the brief examples provided by participants on their ARTs, in addition to the transcripts and reflections, to compile quotes regarding the directions of influence for the affinity relationships. The composite quotes describing the sub-affinities making up each affinity, and the relationships of influence among affinities, form the source material for the rich descriptions typical of IQA representation (Chapters 6–8 in this study).

4.5.3.4 Representation and interpretation of results

Together, the IQA processes just described enabled the construction of answers to the generic research questions posed in section 4.5.1: the affinities — the components of meaning of the phenomenon — and the ways in which they interact in a perceived system of cause and effect can be portrayed in rich, grounded descriptions, relying on participants' own words. Each affinity is presented as comprising several sub-affinities, which in turn are each described by a composite quote, woven together from multiple individual quotes. The relationships of influence among affinities are rendered in the same way.

In this way, IQA aims to reveal the 'truth' as constructed by an individual or group, in the form of affinities and systems diagrams or mind maps. The approach consciously includes elements from three major understandings of the meanings of truth — the correspondence, coherence, and constructive theories of truth (Northcutt & McCoy, 2004, pp. 340–342) — which inform the interpretation of findings.

The correspondence theory of truth sees truth as a correspondence with facts, or reality as observed or experienced. In this case, the study findings correspond with participants' reality, as observed through the data sources (Bargate, 2012).

In the coherence theory of truth, truth is understood as a coherence or congruence with other true statements, or with "the system of rules by which we constitute our experience and our logic" (Northcutt & McCoy, 2004, p. 340). This encompasses

structural coherence, or internal logic and consistency among parts that form a meaningful structure — in IQA and in this study, this understanding of truth would be reflected in coherence among the elements and relationships in the system. Referential coherence, or fitting into a larger system — such as broader theoretical perspectives in this case — is a further aspect. Finally, dramatic coherence exists where the 'characters' are believable and resonate with broader experience; this may be reflected in the participant quotes used to construe the affinities and influences.

The constructivist theory of truth defines truth by its usefulness or pragmatic value: the 'real' truth of a proposition derives from its potential for solving a problem. The study findings offer insights into students' learning, with implications for practice and further research.

4.6 Rigour

In assessing the rigour or quality of research, questions of validity and reliability are commonly raised. A multitude of definitions and constituent types of each term have been suggested in the literature (Cohen et al., 2011). In qualitative research, the criteria of validity and reliability generally used to evaluate positivist research are deemed less appropriate (Denzin & Lincoln, 2011; Rule & John, 2011). Within a constructivist-interpretive paradigm, Denzin and Lincoln (2011, p. 13) advocate trustworthiness, credibility, transferability and confirmability to replace the positivist criteria of validity and reliability.

Guba (1981) emphasizes trustworthiness as the overarching criterion for judging the worth of research, and contends that the term encompasses four concerns: truth value, applicability, consistency, and neutrality of research. While these aspects of trustworthiness are common to all research, they are translated somewhat differently according to the research paradigm. Thus where the 'scientific' (positivist) paradigm would utilize internal validity, generalizability, reliability and objectivity, in the 'naturalistic' (interpretive) paradigm the appropriate parallel constructs are credibility, transferability, dependability and confirmability.

IQA has inherent features promoting rigour in both data generation and analysis (Bargate, 2012; Tabane, 2010). The research design is (i) public and nonidiosyncratic, (ii) replicable within reasonable bounds, and (iii) not dependent (especially for analysis) on the nature of the elements themselves (Northcutt & McCoy, 2004). In IQA research design, "there is a transparent audit trail of the steps followed according to rigorous, reliable and replicable rules resulting in issues commonly associated with qualitative research such as researcher bias, reflexivity, or trustworthiness being eliminated" (Bargate, 2012, p. 73). Thus "IQA certainly supports constructs such as credibility, transferability, and dependability, while highlighting the concepts of validity and reliability" (Northcutt & McCoy, 2004, p. 17).

The four criteria suggested by Guba (1981) are thus directly addressed in my study by the design principles of IQA. In addition, I employed many of the strategies suggested in the literature as means of promoting the trustworthiness of qualitative research, as elaborated here.

Credibility or 'truth value' centres on researchers' ability to take full account of the "bewildering array of interlocking factor patterns that confront them and pose formidable problems of interpretation", to produce findings that are plausible (Guba, 1981, p. 84). Credibility can be promoted by prolonged engagement with the study participants in context (Guba, 1981) — as was the case with my facilitating the tutorials and thus interacting closely with the participants over nine weeks of the semester. This fostered the establishment of a rapport with participants, enabled the collection and understanding of multiple perspectives, and presumably reduced the potential for "social desirability" in interview responses (Baxter & Jack, 2008, p. 556).

Member checking, whereby participants are asked to verify, discuss, clarify and/or contribute new insights to the researcher's interpretations of the data, is also advocated as a means of increasing credibility (Baxter & Jack, 2008; Guba, 1981; Rule & John, 2011). The structure of IQA accommodates and indeed goes beyond this, as was the case in my study. Participants analyzed and interpreted the data themselves in the two focus group sessions, confirmed the write-ups of the affinities I compiled on the basis of their responses, and had the opportunity to elaborate on the affinities and relationships in their individual interviews.

Triangulation — the use of multiple perspectives, methods, or sources of data — is another means of enhancing confidence in research findings (Baxter & Jack, 2008; Guba, 1981). When the same phenomenon is observed from more than one data source, this can enable a fuller explanation, assist the researcher in generating reliable evidence, and contribute to credibility (Cohen et al., 2011). In my study, the two phases of the IQA (focus groups and interviews) were supplemented by the analysis of reflective writing to give additional perspectives on students' learning.

Transferability is proposed as the alternative criterion to (quantitatively orientated) generalizability. Because the objects of qualitative study are considered context-bound, the aim of research is not to produce 'truth' statements that can be generalized, but rather to develop descriptive, context-relevant statements (Guba, 1981). A key strategy suggested for achieving transferability is the crafting of detailed descriptions of the data as well as the context, so that the reader can make comparisons with other contexts. The idea of "reader-determined transferability" (Rule & John, 2011, p. 105) implies that by providing sufficiently thick, detailed descriptions of the case, the researcher is relieved of the "burden" of transferability claims, because the reader is able to determine the level of transferability of her findings. Rule and John note that thick descriptions also contribute to credibility by portraying the "fullness and essence of the case reality" (2011, p. 108). My aim has thus been to provide rich, contextualized descriptions in addressing my critical questions, to strengthen both criteria.

From a more deductive angle, the requirement of applicability may be met with the assertion of analytic generalizability from a case study (Yin, 2009). In analytic (as opposed to statistical) generalization, "previously developed theory is used as a template with which to compare the empirical results of the case study" (Yin, 2009, p. 38), and if two or more cases support the same theory, replication may be claimed. My study was informed by threshold concepts theory, and I have been able to draw comparisons with related findings examining economics students' learning in other contexts, within and outside the TCF.

Dependability concerns the stability of the data, and seeks to address "apparent instabilities arising either because different realities are being tapped or because of instrumental shifts stemming from developing insights on the part of the investigator-as-instrument" (Guba, 1981, p. 86). IQA largely circumvents issues of dependability

because the participants generate, analyze and interpret their data within a predetermined protocol. Creation of an audit trail in the form of case documentation and a running account of the process is an important means of enhancing dependability (Guba, 1981; Rule & John, 2011). IQA creates an audit trail for each stage of data collection and analysis; I also documented the process in my own journal.

Confirmability focuses on the objectivity or neutrality of the data, and involves the minimization of investigator bias (Guba, 1981). As noted, the fact that the participants (rather than the researcher) analyze and interpret the data greatly reduces concerns about dependability and confirmability in IQA (Tabane, 2010). The set of IQA protocols could be expected to promote replicability: adhering to the procedures, different researchers with the same set of focus group data should arrive at the same SID representing the phenomenon, regardless of their individual bias and interpretation of the data (Bargate, 2012).

Triangulation of sources and methods — discussed as a means of promoting credibility — also serves to increase confirmability in this study. Creation of an audit trail as described from the focus groups onward further adds to confirmability by allowing findings to be tracked back to data sources (Rule & John, 2011) and providing an unmediated and bias-free record of participants' experiences.

The practice of researcher reflexivity involves revealing assumptions or biases that may have affected initial questions or interpretations, and is suggested as a further strategy for increasing confirmability (Guba, 1981). I have endeavoured to convey relevant details of my background, experience and interests with regard to economics students' learning, and maintained an awareness of how these might shape my interpretation of the findings (Creswell, 2013). I kept a journal documenting my own reflections, interpretations and concerns (Baxter & Jack, 2008), which served to increase my self-awareness while providing a further record of the course of the study. While this was not a formal data source, in later chapters I occasionally refer to these reflections to reveal my perspective on the meanings offered by participants. Further reflections on my role in the research are offered in section 4.8.

4.7 Ethical issues

Ethical considerations are particularly pertinent when research involves people, and arise throughout the qualitative research process (Creswell, 2013). I addressed the concerns associated with the various stages of this study as follows.

Since the study involved students in a module of the School of Accounting, Economics and Finance (SAEF) at UKZN, before its inception I wrote to the Dean and Head of School — the 'gatekeeper' of the research site — explaining the purpose of my research and requesting permission to proceed (Appendix 1). After obtaining his written approval (Appendix 2), I applied to the UKZN Ethics Committee and received ethical clearance to conduct the study (Appendix 3).

Participants freely chose to take part in the study: I called for interested volunteers from the class at large after explaining what the programme would entail, and the selection of students for the group was based on their submission of application forms indicating that they wished to participate. In the first tutorial session, all participants completed an Informed Consent form (Appendix 4) confirming their agreement to take part in the study. They were informed in writing and (repeatedly) verbally by me that they were free to withdraw from the study at any time, without any negative consequences. I also made it clear that the data collected would only be used for the purposes of this research.

Respect for the privacy of participants is important (Creswell, 2013). I expected that the potentially sensitive or personal nature of the information revealed would require that I ensured confidentiality of the data and participants in the tutorials, focus groups, interviews and reflective journals, as well as in the data analysis and writing up of the thesis. Although the nature of the composite quotes characteristic of IQA representation does not call for individual attributions, there might be other occasions where individual participants would be referred to. I proposed to provide anonymity by using letters or numbers (e.g. 'Student X') when necessary in writing up the results. However, when I reminded the group of this in a later tutorial session, many students expressed pride at having been part of this research and a desire to recognize themselves in any research outputs that referred to them individually. To allow for this, I asked all participants to choose their own pseudonyms (within reasonable limits of length and decorum), which

they were happy to do. The names used to refer to participants in all instances in this thesis — including participants' quoted mentions of each other — are these self-chosen pseudonyms.

I conducted and transcribed all of the interviews myself. The journals of students who chose to write their reflections by hand were transcribed verbatim by a research assistant who did not know the participants and was not provided with their full names, and I checked the transcripts on completion. As required in terms of UKZN's ethics policy, I kept all confidential documents in a safe place while working on the study. On completion, data will remain in the custody of the School of Education for five years, after which it will be destroyed to preclude unauthorized use.

Significant ethical concerns may arise from potential power imbalances in qualitative research, reflected in this case in my position and that of the participants, both in the overall research concept and execution (as researcher and 'subjects') and in individual interactions (as lecturer and students). The use of IQA mitigated possible concerns around ownership, authority, representation, and positionality. Data generation and analytical processes belonged to the participants, who grouped their responses, named the affinities, and described causal relationships among them; the representations that emerged can thus be regarded as capturing the legitimate voice of the participants (Northcutt & McCoy, 2004).

I sought to establish an understanding from the outset that the tutorial programme should be mutually beneficial to the participants and me. I explained my study purpose, the importance of their participation, and my appreciation of their involvement, and told the group frequently that I was open to feedback, critiques or suggestions from them at any time, so that we could ensure they found the tutorials beneficial. While some tacit lecturer–student dynamics were probably inevitable, I strove to minimize these by maintaining an informal relationship and facilitative role in the tutorials, by not evaluating tutorial-related work, and by keeping the group informed of the progress of my research.

To counter perceptions that the group of students participating in this study might receive unfair advantages over the rest of the class, I uploaded all of the tutorial exercises and feedback to the course website, where they were accessible to all Econ

202 students. I did not receive any complaints from mainstream students or have any reason to believe there was a sense of preferential treatment of the participants.

As an overarching principle, research should be mutually beneficial to the participants and researcher (Cohen et al., 2011; Creswell, 2013). I anticipated that the tutorial programme would help student participants to deepen their understanding of concepts covered in Econ 202 by engaging with additional material and applying microeconomic concepts to relevant real-world problems. Beyond these immediate module-related academic benefits, I expected them to gain from working with peers in a structured way, in a small-class context and a relaxed environment. I also hoped that through reflection they would enhance their metacognitive skills, bringing benefits beyond the Econ 202 module. The benefits to me consisted not only in access to information and insights which would allow completion of my research, but also in the opportunity to develop my teaching practice informed by a growing understanding of how students learn this content.

4.8 Methodological reflections

This section offers some brief reflections on my use of the tutorial programme as a vehicle for studying learning, on IQA as I applied it, and on my role and involvement in both.

As described in section 4.6, the structure of the tutorial programme allowed me to use cooperative learning and small-group discussion, which were not feasible in the mainstream group. This approach demanded intense involvement from me in preparation for as well as facilitation during the sessions. I found teaching in this way rewarding and energizing, but knew that the programme was very much a one-off, 'greenhouse' experience that could not feasibly be replicated for the class of several hundred within current budget and timetable constraints.

In offering the tutorials, I was constrained by the mainstream course arrangements alongside which the tutorials ran. Econ 202 is offered to several hundred students on two campuses, with common content and assessments, several lecturers and a course coordinator. I did not have leeway to depart from the pre-existing syllabus or to

redesign assessments to align with the pedagogical approach in the tutorials. Although level 2 assessment moves away from a reliance on multiple-choice questions to include more application and analysis, there is room to redesign these in line with a TC orientation. This may have meant that the potential impact of the TC-infused programme was not fully realized as participants' learning continued to be driven largely by prevailing assessment approaches (Biggs, 1996). (Concerns about assessment arose in individual interviews and reflective writing, and are discussed in later chapters.)

Thanks to the ETC project (Davies & Mangan, 2006b, 2006c), I was fortunate to have access to most of the tutorial exercises I used in a suitable format, and was able to map appropriate activities to what I perceived to be the typically troublesome, transformative elements of the Econ 202 curriculum, using only minor adjustments such as the addition of local examples. Being able to use these activities, which were informed by theory and had been well received in the UK, not only facilitated the development of the programme but also increased my confidence in the approach. This was borne out by the participants' responses. Because the activities were originally designed for first-year economics students, the participants had encountered the embedded concepts in their introductory module the previous year. However, the ways in which concepts were presented in the tutorial exercises allowed for a different take on the material, as well as offering the chance to complete or resolve partial or inaccurate prior understandings.

I had to revise my initial plan to use purposive sampling to select participants from volunteers from the class. As it happened, the number of volunteers was only slightly higher than my intended sample, so I invited all of them to take part in the programme. In effect, the participants therefore self-selected. Over the course of the semester, a few stopped attending tutorials, compounding the element of self-selection of those who remained to take part in the IQA processes. While the lack of attention to representivity is not a major concern since the intention is not statistical generalizability, I am aware that there may have been different insights into learning in economics from those who did not select themselves into the tutorial programme, or who opted out before the end, which will remain uncaptured.

My use of IQA revealed some limitations and possible hazards as well as the advantages noted in describing the approach in section 4.7. Many of my concerns relate

to the pivotal role of the focus group, on which the rest of the approach may be seen to depend. First, the communal nature of the focus group, and its emphasis on group reality, seem to reflect an assumption that there exists a single, albeit complex, group reality that can be satisfactorily captured in the SID. The IQA guidelines (Northcutt & McCoy, 2004) do not offer steps to follow if participants cannot reach complete agreement before time and energy run out. In my focus groups, my observations suggested that the participants reached consensus relatively smoothly, and I did not have to respond to this type of dilemma. A concern remains, however, that in seeking consensus, the focus group processes might simply be masking conflict and attaining compromise — the appearance of agreement. The silent nature of brainstorming and clustering in IQA, while offering advantages, may not reveal unresolved conflicts of meaning among participants. Because IQA captures only what is said (or written), even though there did not seem to be much controversy in my focus group sessions, the apparent consensus reflected in the affinity write-ups contains the silences of some participants, on some affinities at least.

To illustrate with an affinity which will be discussed in more detail in subsequent chapters, one of the affinities identified by the focus group and elaborated in individual interviews was ‘Goals’. There was a relatively small cluster of index cards under Goals, most of which mentioned long-term aspirations favouring economics, indicating that many participants had not written responses relating to their goals during the brainstorming phase. In the interviews, however, all candidates elaborated on what the Goals affinity meant to them — including those with narrow goals focused only on passing the course, which had not emerged as part of the focus group brainstorming. The range and complexity of meanings attributed to this affinity thus increased dramatically after the interviews.

This example serves to illustrate how the interviews may address some of the concerns around consensus and silence, by offering an opportunity to explore individual variations in the meaning of affinities. However, the interviews are themselves bounded and structured by the affinities, which inform the interview protocol and therefore largely determine the issues to be discussed. Thus while the grounded, participant-driven nature of affinities (and their interrelationships as depicted in the SID) is one of IQA’s key strengths, this may be a double-edged sword: once confirmed, the affinities

are set, and the researcher and readers are called on to trust that they are a fair representation of the participants' reality. While Northcutt and McCoy (2004) point out that the interviews can act as a check of the affinities and influences, they do not offer comment on the possibility that the affinities and system produced by the focus group in the first place may be flawed. Again, this underlines the critical importance of the execution and functioning of the focus group.

Although IQA calls for a single focus group session, in this study I had scheduled two sessions a week apart, which allowed me to write up the affinity meanings (as described in 4.5.3) after the first session, for the group to check and confirm at the second. This was fortunate, because in writing up the affinities and reviewing the IQA guidelines, I came across some anomalies (discussed further in section 5.2.1 in the next chapter) which I had to ask the group to reconsider and clarify at the follow-up session. The revisions they subsequently made affected the SID, the interviews, and ultimately the findings of the study. In short, IQA protocol is not self-driving: the focus group phase needs careful planning and management, because all of the phases that follow hang on the credibility of the affinities. Practical considerations should not be overlooked, given the importance of this phase. I found the focus group sessions to be more time-consuming than I had anticipated, and at times logistically challenging, with 20 participants ranging back and forth along the array of cards attached to a wall. Allowing for two consecutive sessions might be an advisable adjustment to the IQA prescriptions — although it also increases the demands made on participants.

I believe the willingness of the participants in this study to commit so much of their time to the focus group sessions, subsequent individual interviews, and reflective writing, was due to several factors, including the relationship I had established with the group over the semester, their relationships with each other, their understanding and support of the purpose of my research, and an appreciation of having their views heard. These factors may account for their wishing not to be anonymized, as noted in section 4.7. The level of commitment of the participants was essential to obtaining the depth of data which was generated in these phases of IQA.

The written reflections which I requested of participants were an addition to standard IQA practice, which I hoped might offset some of the concerns around silence or conflict noted above: as a less focused and more private medium, reflective writing

might be a channel for insights students would not mention in the focus groups or interviews. My confidence in the affinities was increased when I found that the reflective writing could be accounted for within those categories of meaning. This modification to IQA may also have enhanced the quality of the data by predisposing the participants to think more widely or introspectively during the focus group phase, since they would have reflected regularly on their learning over the preceding weeks.

A consideration of issues of representation in IQA highlights similar concerns to those mentioned in the preceding paragraphs. Section 4.5.3 describes IQA's reliance on composite quotes, woven together from individual sources to sound like a single voice, to elaborate the affinities. This practice presents a trade-off: while a holistic and nuanced picture is created for the group, individual voices are not reflected or tracked in these aggregated quotes. In deepening the analysis and presenting the data following the individual interview phase (Chapters 6–8) I have tried to be aware of the silences from individual students on some issues, and to account for variation in the tone of individual experience of some affinities. At times I have departed slightly from standard IQA presentation, to note my own observations or to separate out distinct groups of voices within an affinity.

In doing so, I have been aware of possible tensions or contradictions — after all, IQA is about privileging student voices and minimizing research influence. However, from my experience the method as it stands already requires significant researcher engagement in deeper analysis and representation. While IQA is intended to be exactly replicable, this applies to the extent that different researchers presented with the same set of affinities and interrelationships would arrive at the same SID representing participants' views of the phenomenon. Faced with an abundance of qualitative descriptions from the interview transcripts and reflective writing, I had to exercise my judgement, drawing on my own experience and understandings to select and compile composite quotes capturing the range of meanings participants ascribed to the affinities and their influences on each other. I am aware that in this sense my tracks as researcher are all over the data, and it seems disingenuous to suggest that the process of representation and interpretation in IQA is neutral, objective, or unequivocal beyond the production of the SID. Given this, I believe the occasional departure from protocol does not detract

from the advantages of IQA as I have used it, but — if transparently and reflexively undertaken — may serve to offset some drawbacks or shed light on some blind spots.

I reflected on my multiple roles as lecturer/tutor/researcher in Chapter 1. The different perspectives on students' learning these roles afforded me assisted me in further analyzing and interpreting participants' descriptions of their learning. In qualitative enquiry such as this, the researcher is a key research instrument (Creswell, 2013). My experience in this study resonated with the view that the researcher's history and pre-judgement — while they should still be declared — are not contraband, but legitimate assets in the research process, making up the "historically-effected consciousness" which creates a "horizon of understanding" (Gadamer, 2012, as cited in McNess, Arthur & Crossley, 2015, p. 305). Furthermore, I was aware of my own investment in the tutorial programme, and in the students' learning. Teaching, as I experienced it in the tutorial programme, was an exciting and rewarding process; I came to know every participant and witnessed some of their learning struggles and successes at close range. Given that 'objectivity' — in the sense of my being detached and disinterested in the participants and the course of their learning — was not possible, 'aware empathy' seems an appropriate stance for me to have adopted.

The question of my involvement and investment in the group also chimes with shifting ideas of insiders and outsiders in qualitative research (McNess et al., 2015). Clearly, I was not an objective outsider as just described. To some extent, the participants seemed to have constructed me as an insider, for instance referring to me by my first name and (in the focus group) assigning mentions of me to the Group Dynamics affinity. For my part, beyond the "dazzle" (McNess et al., 2015) of the obvious differences (in status, age, race, and in many cases home language) between the participants and me, I empathized with them as students learning a new, sometimes troublesome discipline that might demand that they tolerate uncertainty, let go of old understandings, and reconstitute their identities — because this resonated with my concurrent experience in reading for a PhD. At the same time, obvious and undeniable power differentials remained in my role as their lecturer (and eventual examiner). Using IQA as a research approach helped to reconcile these positions, and mitigated my own discomfort around my split roles. By casting the participants as the experts on their own learning and further blurring the boundaries between insider and outsider, IQA remained consistent

with the dismantled authority relationships which characterized the cooperative learning pedagogy of the tutorials.

4.9 Concluding comments

This chapter has described the research design and methodology I used in seeking to enhance understanding of the processes and experiences of students' learning in economics: a case study within a qualitative, interpretive paradigm, involving participants in a threshold concepts-infused tutorial programme. Interactive Qualitative Analysis — the approach I used to generate and analyze data — was explained. I also considered issues of rigour, and the ethical considerations affecting this study, before offering some reflections on the methodology, and on my role in the research. Chapter 5 provides detailed description of the application of IQA in the focus group sessions, and presents the SID which represents the group's view of their learning in the TC-infused programme.

CHAPTER 5
GROUP REALITY: AFFINITIES, INFLUENCES AND SYSTEMS DIAGRAMS

5.1 Introduction

In this chapter I will describe how I applied the first phase of the IQA process, outlined in Chapter 4, to arrive at a representation of the group's understanding of their learning in the TC-infused tutorial programme. Section 5.2.1 explains how the focus group generated data and applied inductive coding to identify the affinities making up their learning. Section 5.2.2 relates the process by which participants recorded their views on the relationships of influence among these affinities, and the IQA procedures I followed to capture a composite representation of these affinity interrelationships for the group as a whole. The visual representation of the affinity relationships in the form of SIDs is developed in section 5.2.3, and a brief verbal interpretation of the SID is offered in section 5.2.4. Section 5.2.5 considers feedback loops or sub-systems which are evident in the SID, and arrives at a 'zoomed out', minimized view of the SID. Section 5.3 provides a chapter synthesis. The affinities and interrelationships developed in this chapter informed the protocol for the semi-structured interviews, which were used to elaborate them at an individual level. The detailed descriptions that participants gave in the interview phase are presented in Chapters 6, 7 and 8.

5.2 The IQA process

The IQA process blends qualitative and quantitative analysis, garnering the richness, variety and detail of qualitative responses, and applying quantitatively oriented protocols to distil powerful and replicable outcomes (Winston, 2011). The approach begins with, and returns to, words. The responses and affinities that comprise the first set of data are all verbal expressions of the participants' understandings. Quantitative rules are followed to impose structure and allow visual representation and interpretation of the system of meaning. Further clarity is attained through individual thoughts and

perspectives elicited in interviews (a return to words), which reveal the shades of variation within the affinities and their interrelationships.

The IQA phases of focus group, interviews, analysis, and representation, were described in Chapter 4. The aim of the focus group phase (the subject of this chapter) is to identify affinities (components of meaning of the phenomenon) and the relationships of influence among these. These are captured in a systems diagram, to be elaborated in the individual interview phase. In my study, the focus group sessions were intended to generate responses that would capture a common perspective and shed light on the participants' learning in the TC-infused tutorial programme.

5.2.1 System elements: Focus groups and affinity generation

Selection of participants for the focus group should be made based on the criteria of power over and proximity to the phenomenon, as noted in Chapter 4 (Northcutt & McCoy, 2004). Northcutt and McCoy (2004, p. 87) further suggest that focus groups should have 12–20 members, who are information rich, possessing knowledge and experience of the issue; can reflect on the question and express those thoughts in words; have the time and inclination to take part; are homogenous with regard to distance and power; and can work within a group without being excessively dominant or timid. It was self-evident that the students who participated in the tutorial programme should make up the focus group for my study, because of their proximity to and power over the phenomenon of interest. Having studied Intermediate Microeconomics and been part of the tutorial group for the semester, their learning was my 'phenomenon'. The students knew that my study was about their learning and had already embarked on some reflection in their written work. I used the regular tutorial time slot when I knew they were available, gave them advance notice of the focus group sessions, and provided lunch. After several weeks of regular interaction, they knew each other well and were comfortable with and respectful of each other, so the group processes worked smoothly.

I facilitated two IQA focus group sessions towards the end of the semester, in two final meetings scheduled for the usual weekly tutorial time (though both ran over time). The first session lasted almost three hours and the second, follow-up session about two

hours. Both were attended by 20 of the 21 regular group participants (two individuals each missed one of the focus group sessions because of illness).

5.2.1.1 Generating responses

Following suggestions made by Northcutt and McCoy (2004), I began the first session with a warm-up exercise using guided imagery to help participants to relax, clear their minds, and reflect on their learning in Intermediate Micro over the semester. Thereafter, I read them 'issue statements' (Appendix 7) designed to generate responses to my research questions, ending with "Tell me about your experience with learning in economics this semester", and assurances that there were no right or wrong answers, and that participants were the experts on their own learning.

The participants then engaged in about 15 minutes of silent brainstorming, during which they recorded all their individual, spontaneous responses on index cards. I asked them to record one thought or experience per card, using words, phrases, sentences or pictures. Once it was apparent that most participants had exhausted their ideas and captured all their responses on index cards, these were collected and randomly affixed to the wall by several volunteers from the group. In all, 262 responses were generated. (These are recorded in Appendix 8.)

5.2.1.2 Clarification

The next step in the IQA process is clarification of the meaning of the responses to reduce any vagueness or ambiguity and reach a "socially constructed, shared meaning" of each response within the group (Northcutt & McCoy, 2004, p. 94). Although the cards are individually written, the responses remain anonymous and are 'owned' by the group, so that any participant can offer an interpretation of the meaning of a given card. A volunteer from the group read out the cards; however, this proved quite a slow process and very few responses required clarification, so when I noticed the group becoming restless and distracted after about two thirds had been read out, I decided to ask them to scan the remainder on their own and identify any further responses that needed clarification. I also scanned the cards and called out any further responses that I

thought might not be clear for elucidation by group members. By the end of this process, the participants agreed that they had reached a common understanding of the meaning of each response. Interestingly, several of the responses used economic concepts or techniques (such as a rising graph to depict learning, and an equation suggesting marginal benefit exceeded marginal cost in the tutorials) to express the intended idea. This phase was audio-recorded.

5.2.1.3 Inductive coding: Clustering

The clustering phase of IQA requires group members to categorize the responses in an inductive coding process. I asked participants to review all the cards and group them into similar themes (these would become the IQA affinities). The group members were content to abide by the IQA requirement of silence (to avoid the domination of the process by a few individuals) as they moved up and down the length of the wall, sorting and shifting cards until all were satisfied with the thematically organised clusters. Five broad groupings of cards were evident.

5.2.1.4 Axial coding: Naming and refining

The next stage is axial coding, in which participants "name, reorganize, clarify and refine" the emergent affinities and any component sub-affinities identified within each cluster (Northcutt & McCoy, 2004, p. 98). I facilitated this process, guiding the participants to suggest names for each affinity and discuss the alternatives until they reached consensus. A volunteer wrote the names on to coloured cards which were affixed above each cluster. A few miscategorized cards were reassigned as the group reviewed the response clusters while referring to the newly assigned labels. This phase was audio-recorded, and I photographed the clusters of cards making up each affinity.

The five affinities were identified as:

- Positive Outcomes: with two sub-affinities named
    - Group Dynamics
    - Personal Outcomes

- Learning Journey: with one sub-group of responses named
    - Challenges / Stumbling Blocks
- Economic Thinking
- Goals
- Feelings

I concluded the focus group session at this point as three hours had passed and some students had other commitments. I undertook to email them a write-up of the affinities, which we agreed to review in a second session a week later.

5.2.1.5 Affinity write-up

Over the following days, I wrote up the affinities following IQA guidelines, drawing on the response cards and the discussions around naming to compile a paragraph for each affinity, describing it "clearly and directly, remaining faithful to the language used by focus group members and following the sense of what participants were saying" (Northcutt & McCoy, 2004, p. 100). These portrayals are fairly brief, because the IQA focus group protocol is not designed to evoke thick description — the latter is yielded by the individual interviews, the protocols for which are in turn informed by these write-ups (Northcutt & McCoy, 2004).

The affinity write-ups I drafted were to be reviewed, revised and confirmed by the participants. It became apparent to me while re-reading the advice provided by Northcutt and McCoy (2004, p. 103) that the two sub-affinities identified under Positive Outcomes were pointing to "more than one category of meaning … (and thus) probably should be subdivided", so I would need to put this to the group to consider in our final session. I also noted that the Learning Journey affinity had one named sub-affinity (Challenges / Stumbling Blocks), while the balance of the responses remained unlabelled under the overarching affinity title; the group would need to review this cluster and decide on a name for the other sub-affinity. I emailed the draft write-ups to all participants and reminded them of our final session in which we would review and confirm the write-ups and consider the latter issues of sub-division and naming.

Twenty participants attended the final session. We read through the write-ups for each affinity (on handouts I had prepared and Powerpoint slides). The group confirmed that the meanings I had captured were accurate reflections of their shared understanding. They were in favour of making the two sub-affinities initially identified under Positive Outcomes into two separate affinities: Group Dynamics and Personal Outcomes. In considering the Learning Journey affinity and the unnamed sub-cluster, participants decided that responses referring to learning successes should be merged into the Challenges / Stumbling Blocks sub-affinity, which would be re-named *Stumbling Blocks and Successes*. They settled on *Learning about Learning* as an appropriate name for the remaining unlabelled cluster comprising the overarching Learning Journey affinity. They confirmed that they still agreed on the names assigned to the other affinities at the previous session. This process was again audio-recorded.

The first part of the final focus group session thus yielded six affinities, in alphabetical order:

- Economic Thinking
- Feelings
- Goals
- Group Dynamics
- Learning Journey: comprising two sub-affinities
    - *Stumbling Blocks and Successes*
    - *Learning about Learning*
- Personal Outcomes

These affinities were used to develop the protocol for the semi-structured individual interviews that made up the second data-generation phase of the IQA and are the subject of Chapters 6–8. The final versions of the affinity write-ups as confirmed by the focus group participants follow.

Economic Thinking

This affinity describes the economic approach to analyzing problems that participants identified as an important part of their learning. Participants noted that they find themselves recognizing the relevance

of economic techniques to situations outside of lectures / tuts, and applying economic analysis to aspects of their everyday lives. "Economics is everywhere around us." This was reflected in many responses referring to specific economic concepts: "The concept of logic of choice has now been incorporated into my life as I now look to maximize my benefits / purchases." And, "Opportunity costs: ruined my life…. Can't make a decision without crying over what I gave up". Marginal analysis, summed up as MC = MB, was another commonly mentioned economic idea, as were graphical techniques. Students felt that this way of thinking they are acquiring is distinctive, or particular to economics: "I think differently" and "…the thought of knowing something that a lot of people do not know is fascinating". The relevant language of economics is also part of this: "Got to have words to use wrt thinking like an economist... I learned to apply Econ in real life or use its concepts and terms on a normal day".

Feelings

This affinity represents the range of emotions students experienced while learning Econ 202 and participating in the tuts. Some mentioned their initial feelings of stress: "At the beginning I was anxious and nervous... It's felt scary to learn new things at first… The first day of the tut I was a bit intimidated, especially by my peers because I thought I did not know much about economics". Many expressed positive feelings for the tuts, which were "fun" and "exciting". Sketches of smiley faces and hearts reflected these positive feelings, as did "I think I now LOVE economics ☺ " and "I love the tuts group". On the other hand, test results sometimes brought negative emotions: "Disappointment... Hated test 1 result". Some students linked feelings to a sense of feeling valued and comfortable: "Was very excited about being chosen to be a part of the group... Felt good cause people would listen when I speak in the TC

tut... Feels like home". Positive feelings also came from mastering new ideas: "Not my fav module at first, understanding makes it more fun", and (with a sketch of a widely grinning happy face ☺) "Me, when I finally get a concept".

Goals

This affinity refers to future plans or aspirations which some students noted as elements of their learning economics. "I want / need to be an economist... Future plans refined... Future economist – goals... Felt that I gained more of an interest in myself in becoming an economist during this process".

Group Dynamics

The tuts were considered an important part of students' learning, because of their content (applied examples focused on concepts) and enjoyable format (informal group discussion, short written components and feedback, and two classroom games). "TC seemed more helpful than the lectures / lecture content… Found the tutorials to be important to my learning... Enjoyed attending the tuts hence why I never missed 1..... Working through examples – writing not just reading... Playing games to help understand concepts... Tuts were intellectually stimulating". Students highlighted the role of the group discussions in their learning, and how they learnt from each other: "Discussing ideas / concepts in TC groups of 4 diff people = diff explanations… Enjoying help of others through learning process… Learnt a lot from my peers in discussion… Discussions in groups were amazing… Sharing of ideas taught me a new way of thinking… Group discussions help develop my knowledge in economics". The

group also provided support and a sense of connectedness or community: "I found that learning is much easier when you learn with other people, other than sitting with a book alone… The TC is like family to me… Knowing I'm not alone in the Econ struggle LOL [laugh out loud]!... Safety net… New relationships. Friends." Some also noted positive impacts of my role as tutor / facilitator in the groups, e.g. "[Tutor's first name]… facilitated our thinking and work environment… open up my mind I like the way you teach ☺!!"

Learning Journey

The Journey affinity encompasses students' progression or path in learning economics, and entails a shift in 'where they are' in their understanding over time. "Learning is going through a tunnel". Two sub-affinities comprise the Journey:

i) Stumbling Blocks and Successes

Here many students referred to specific concepts they had struggled with, elasticity being the prime candidate: "Difficulty in understanding elasticity... Stuck on elasticity... Elasticity still raise my blood pressure". Another example was welfare - "Welfare still puzzles me". Participants also highlighted graphical modelling as a challenge: "Can't get a handle on all those graphs... Graphs (I've learned I have not grasped graphs so much yet, I still find them bit difficult)". Some also pointed out that grasping these concepts would allow them to advance: "Know how the graphs work and you're set… (With a sketch of a lightbulb) Finally grasping what 'marginal' means." Students also noted how they broke through or reached understanding: "Isoquants were a problem… overcame by talking to [tutor's first name] & Thando... Using logic and what I would do in

everyday life to grasp concepts... To get unstuck I turn it into tut exercise… Overcoming of the aspects that were difficult through giving it more time to focus on." Having understood economic concepts brought other learning benefits such as increasing lecture attendance and better understanding of textbook examples. Students also reported changed and broader perspectives or a different view of the world as a result of their learning: "Broadened econ perspective on life - everyday living... Rebirth... A lot of Aha moments... Saw economics as a cog in a machine that most people are unaware of. Economists being the exception... The concepts as a whole are theories of things we see and experience every day... Connecting dots"; and "As if a cloud of fog lifted understanding economics through discussion was helpful ☺."

ii) Learning about Learning

As part of the learning journey, many students made more general observations about how they learn. Some recognized where weaknesses lay in their attitudes or approaches: "I need to get rid of this mentality of 'if I at least know 60% of the work, I'm ok'... Procrastination is my nemesis". They also noted new insights for success: "In learning new things it helps to go over that thing often because the fifth time I might catch something that I did not get at first... No more memorizing instead of understanding".

Personal Outcomes

This affinity refers to the benefits students derived from participating in the weekly tut group sessions. As one participant summed it up in economic terms, "MB ≥ MC in this tut". Responses reflected personal growth or development: "I learned a lot both academically & as a person… Got to grow as a person… Self-discovery." Many referred to an increase in their confidence, both academically and more

generally: "Confidence… Self confidence… Gained more confidence… I can talk about economics on any other courses with confidence… Learned to be comfortable around my peers." Participating in the tut group also gave students new perspectives: "Opened up my general knowledge… Eye opener… Open minded… Mind opener… Enlightening… Exploration."

The affinities generated in the phase just described begin to address the first of two questions posed in IQA enquiry: "What are the elements of the system?" (Northcutt & McCoy, 2004, p. 103). The affinities represent the components of reality of the group with respect to the phenomenon under study — their learning in the TC-infused tutorial programme. The second question asks, "How do these elements relate to each other?" (2004, p. 103). Participants are led to address this question through a deductive process, again following clear IQA protocol.

5.2.2 System relationships

IQA uses Affinity Relationship Tables (ARTs) to facilitate theoretical coding, as participants identify relationships of cause and effect between pairs of affinities. Several protocols may be followed in completing the tables. In the focus group for this study, I used independent individual coding, which takes the most time in the focus group but is thought to yield the highest quality and richness of data (Northcutt & McCoy, 2004, p. 165). (Alternative methods that are less time-consuming, but not as generative, include dyad or triad coding, and researcher-led group discussion and informal consensus.)

5.2.2.1 ART completion

Once the affinity write-ups had been confirmed, the group members worked individually on completing their ARTs. I had pre-printed blank forms (shown in Figure 3 below) on which they filled in the affinities 1–6, and then for each pair relationship between affinities, decided on the direction of influence (if any) and provided a short

justification (an example or 'if…, then' statement) of their indicated relationship. With six affinities, 30 affinity pair relationships arise for consideration. An excerpt from the ART is shown below (with only the first five pair relationships shown here for brevity). Most of the participants completed their tables in the session; a few took them home to finish and brought them to me a day or two later.

Many of the themes or affinities identified have some kind of relationship; one affects or causes the other. Please look at each theme and decide if or how it relates to each other theme. For each relationship, please give a specific example of how the relationship has affected your experience. (This can be in everyday language, or as a hypothesis – IF…, THEN…)

Affinity name:

1. Economic thinking
2. Feelings
3. Goals
4. Journey:Stumbling blocks & successes
Learning about learning
5. Group dynamics
6. Personal outcomes

Possible relationships:
A → B
A ← B
A <> B (no relationship)

Affinity Pair Relationship ← / → / <>		**Example of the relationship in natural language or 'if, then' statement**
1	2	
1	3	
1	4	
1	5	
1	6	

Figure 3. Affinity Relationship Table (ART) form

The completed ARTs were used to create the IRD (explained below). The brief examples participants provided in the right-hand column of the ART were used to supplement transcripts and reflections in compiling quotes illustrating the directions of influence for the affinity relationships, as described in Chapter 4.

5.2.2.2 Group composite affinity relationships: Pareto Protocol

ARTs may be analyzed at a group and/or individual level to create an IRD — a matrix showing all the perceived relationships in the system (Northcutt & McCoy, 2004). I worked at the group level to create a composite IRD, aggregating the responses for each relationship pair in the completed ARTs from 21 participants.

IQA applies the Pareto Protocol[23] as a statistical method for determining which of the inter-relationships should be included in the IRD. The Pareto Principle (or 80/20 rule) is established in management and systems theories and may be stated as, "something like 20% of the variables in a system will account for 80% of the total variation in outcomes" (Northcutt & McCoy, 2004, p. 156). The optimal[24] number of relationships to include in a model or representation of the system is "… the fewest number of relationships (for parsimony's[25] sake) that represents the greatest amount of variation (for the sake of comprehensiveness and richness)" (Northcutt & McCoy, 2004, p. 157). In applying this protocol I followed the steps prescribed by IQA. The process and its outcomes are recorded in Table 1 below.

[23] Named for the economist Vilfredo Pareto (who is better known within the discipline for his conception of efficiency).

[24] This is consistent with the use of the term "optimal" within economics: only those relationships for which the marginal "benefit" (of explaining more variation) is greater than or equal to the marginal "cost" (of adding another explanatory variable) should be included in the analysis.

[25] 'Occam's razor', or the law of parsimony, advocates "economical description(s) of natural phenomena", favouring "simple but evocative models" and eschewing "overelaboration and overparameterization" (Box, 1976, p. 791).

Table 1. Affinities: descending order of frequency with power analysis

	Affinity pair rship	Frequency	Cumulative freq	Cumulative % rships	Cumulative % freq	Power
1	1←5	19	19	3.33	6.51	3.18
2	5→6	17	36	6.67	12.33	5.66
3	1←4	16	52	10.00	17.81	7.81
4	4←5	16	68	13.33	23.29	9.96
5	4→6	16	84	16.67	28.77	12.10
6	2←5	15	99	20.00	33.90	13.90
7	1→6	14	113	23.33	38.70	15.37
8	2→3	13	126	26.67	43.15	16.48
9	2←4	13	139	30.00	47.60	17.60
10	1→3	12	151	33.33	51.71	18.38
11	1→2	11	162	36.67	55.48	18.81
12	2←6	11	173	40.00	59.25	19.25
13	3→4	11	184	43.33	63.01	19.68
14	3←4	10	194	46.67	66.44	19.77
15	3←5	10	204	50.00	69.86	19.86
16	3→6	10	214	53.33	73.29	19.96
17	3←6	9	223	56.67	76.37	19.70
18	1←2	8	231	60.00	79.11	19.11
19	2→4	8	239	63.33	81.85	18.52
20	1←3	7	246	66.67	84.25	17.58
21	2←3	7	253	70.00	86.64	16.64
22	2→6	7	260	73.33	89.04	15.71
23	2→5	6	266	76.67	91.10	14.43
24	1→4	5	271	80.00	92.81	12.81
25	1←6	5	276	83.33	94.52	11.19
26	4←6	5	281	86.67	96.23	9.56
27	3→5	4	285	90.00	97.60	7.60
28	4→5	3	288	93.33	98.63	5.30
29	1→5	2	290	96.67	99.32	2.65
30	5←6	2	292	100.00	100.00	0.00

The first step is a frequency tally: I counted the 'votes' for each of the 30 affinity pair relationships, recording them in an Excel spreadsheet. In total, the participants cast 292 votes for relationships of influence. (Affinity pairs for which participants filled in 'no relationship' do not enter further into the analysis.) I sorted the relationships in descending order of votes (**frequency**), and then calculated **cumulative frequencies** (Columns 1–4 in Table 1).

The fifth column shows the **cumulative percentage of total possible relationships** as additional affinity pairs are considered. Each successive relationship adds 1/30 of the total, or 3.33% (so, for instance, the first six relationships cumulatively account for 6/30 or 20% of all possible relationships, while all 30 account for 100%). The sixth column shows the **cumulative percentage of frequency**, i.e. of votes cast (based on the total of 292 votes) for the successive affinity pairs. (Thus the first relationship drew 19 of the 292 votes, or 6.51%; the first 10 relationships together accounted for 151/292 votes, or 51.71%.) In other words, the entries in this column reflect how much of the total variation in the system (the 292 votes) is accounted for by the (cumulative) relationship pairs. **Power**, in the final column, is the difference between the preceding two columns, i.e. cumulative percentage (frequency) less cumulative percentage (relationships).

Deciding which affinity pair relationships ought to be included in the group IRD necessitates a trade-off between accounting for maximum variation in the system, and minimizing the number of relationships for the sake of parsimony. This trade-off is captured in the power index — when power is maximized, we optimize the number of relationships where the relationships account for proportionately most explanatory power. The power index thus gives effect to the Pareto Protocol. For the current study, although the proportions are not exactly 80/20, it is still clear from Table 1 that a relatively smaller proportion of the relationships account for most of the variation. Power is maximised at 16 relationships: the first 16 pairs (53.33% of total relationships) account for 73.29% of the variation, and this is the number at which the gap between those two proportions is maximized. The first 16 relationships — the shaded rows in Table 1 — would thus be the optimal number to include in the IRD. (Appendix 9 contains graphs that offer an alternative way of illustrating the application of this principle.)

5.2.2.3 Group composite: Interrelationship Diagram (IRD)

The IRD is a matrix summarizing the selected affinity pair relationships in the system, using arrows to indicate whether each affinity in the pair is perceived as a cause or effect. The arrows point left or up to indicate direction of influence, and each pair relationship requires two 'entries'. For instance, in Table 2, in row 1 the up arrow in the column headed '2' indicates that affinity 1 (Economic Thinking) influences affinity 2 (Feelings). The same relationship is captured in the second entry for that affinity pair, in row 2, where the left arrow in the column headed '1' shows that affinity 2 is influenced by affinity 1. Both arrows can be seen to point from affinity 1 to affinity 2. (I have included the affinity names in the leftmost column for explanatory purposes only; at this stage, IQA requires no interpretation and typically only numbers and directionality — arrows — are presented.)

Fifteen of the 16 relationships identified for inclusion are recorded in Table 2. I encountered some ambiguity in the entries for affinity pairs 3 and 4, because following the Pareto Protocol allowed the inclusion of relationships of influence in both directions (see relationships 13 and 14 in Table 1: 11 votes were cast for 3 → 4, and 10 for 3 ← 4). In the IRD table, I chose to reflect the slim majority favouring the former, but initially noted this with a question mark as an issue to revisit in the later step of determining drivers and outcomes.

Table 2. Tabular IRD

		1	2	3	4	5	6	Out	In	Δ
Economic Thinking	1		↑	↑	←	←	↑	3	2	1
Feelings	2	←		↑	←	←	←	1	4	-3
Goals	3	←	←		↑	←	↑	2	3	-1
Journey	4	↑	↑	←		←	↑	3	2	1
Group Dynamics	5	↑	↑	↑	↑		↑	5	0	5
Personal Outcomes	6	←	↑	←	←	←		1	4	-3

The arrows are then tallied in order to see whether each affinity is a driver or outcome in the system. This is summed up in the final three columns, where ‘out’ denotes the number of up arrows for an affinity, and ‘in’ is the number of left arrows (respectively, these are interpreted as ‘influencing’ or ‘being influenced by’). Delta (Δ) is calculated as the ‘out’ total less the ‘in’ total, and thus reflects the degree to which an affinity influences (or is influenced by) the others. Having calculated delta, the affinities are re-ordered in descending delta order, as shown in Table 3.

Table 3. Tabular IRD in descending order of Δ

		1	2	3	4	5	6	Out	In	Δ
Group Dynamics	5	↑	↑	↑	↑		↑	5	0	5
Economic Thinking	1		↑	↑	←	←	↑	3	2	1
Journey	4	↑	↑	←		←	↑	3	2	1
Goals	3	←	←		↑	←	↑	2	3	-1
Feelings	2	←		↑	←	←	←	1	4	-3
Personal Outcomes	6	←	↑	←	←	←		1	4	-3

The value of delta is used to designate affinities as drivers or outcomes within the system (and guides their placing on the systems diagram) (Northcutt & McCoy, 2004, p. 173). Affinities with positive delta values (5, 1 and 4) are relative drivers, while those with negative delta (3, 2 and 6) are relative effects or outcomes. A driver which has a high delta resulting from many 'outs' but no 'in' arrows may further be classified as a *primary driver*: "a significant cause that affects many other affinities but is not affected by others" (2004, p. 173). Affinity 5 (Group Dynamics) fits this definition. *Secondary drivers* are characterized by having both out and in arrows, but positive delta values reflecting a preponderance of 'outs' (affinities 1 and 4). Likewise, all of the outcome affinities in Table 3 would be *secondary outcomes* — relative effects, identified by having some 'out' arrows but a greater number of 'in' arrows. (A *primary outcome* would show only 'in' arrows, reflecting that it is influenced by but has no impact on the other affinities; the system in this study did not show any outcomes in this category.) The tentative assignment of affinities is shown in Table 4.

Table 4. Tentative SID assignment (focus group)

Affinity		Assignment
5	Group Dynamics	Primary driver
1	Economic Thinking	Secondary driver
4	Learning Journey	Secondary driver
3	Goals	Secondary outcome
2	Feelings	Secondary outcome
6	Personal Outcomes	Secondary outcome

At this point I revisited the ambiguity or 'split vote' around the directionality between affinities 3 and 4 noted above. If I had chosen to 'share' the directionality, or to omit the relationship from the delta calculation since both arrows were almost equally weighted, this would not have affected the assignment of either — it would merely have resulted in a slight increase in the delta value of affinity 4 and corresponding decrease for affinity 3, confirming their respective designations as secondary driver and secondary outcome.

5.2.3 Focus group Systems Influence Diagram (SID)

The SID is the culmination of the IQA phases described here; it is a visual representation of the information in the IRD, summing up the system of affinities and their interrelationships (Northcutt & McCoy, 2004).

5.2.3.1 Cluttered SID

The IRD and affinity assignments are used to construct the SID. Affinities are arranged from left to right in descending order of delta, so that primary drivers are placed on the extreme left, followed by secondary drivers, with outcomes ranged on the right-hand side. The first version of the SID shows every link from the IRD: an arrow is drawn for

each relationship, so that the diagram is "saturated" with all possible links from the IRD (Northcutt & McCoy, 2004, p. 176).

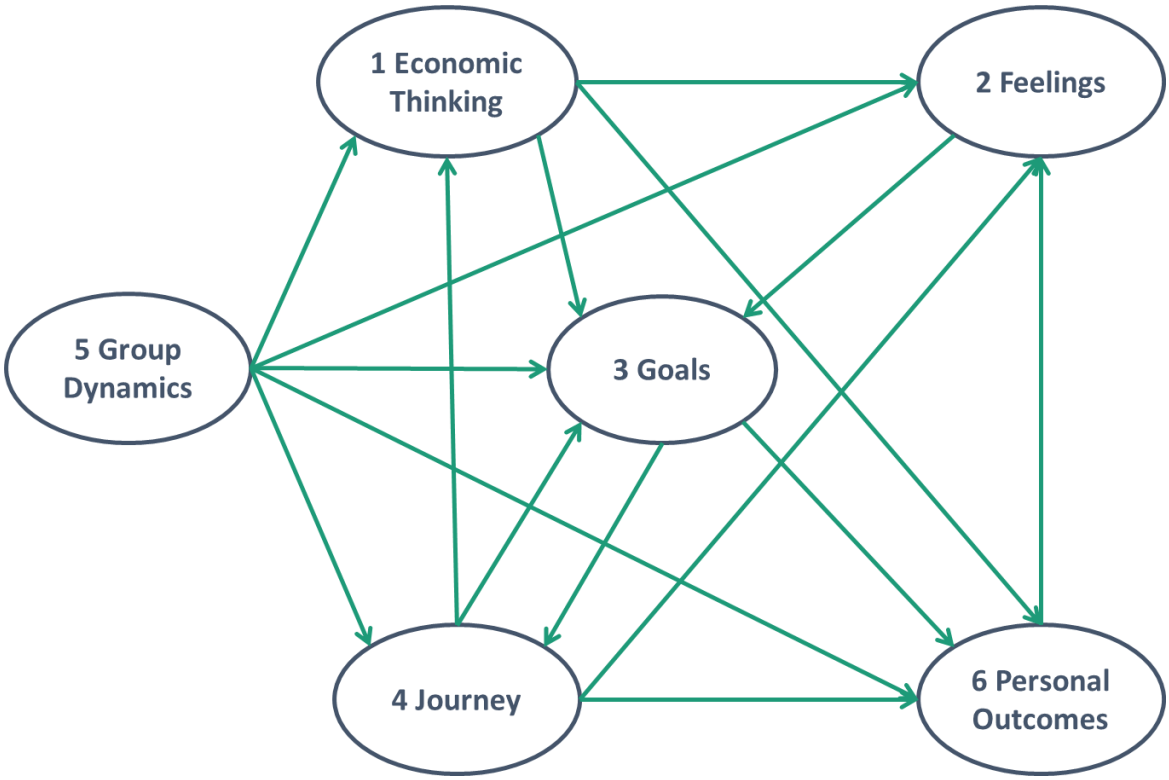

Figure 4. Cluttered SID

Figure 4 shows the Cluttered SID representing the findings from the focus group sessions for this study, showing the six affinities participants identified and how each influences or is influenced by the others.

5.2.3.2 Uncluttered SID

While the Cluttered SID makes for a comprehensive and rich presentation, it can be difficult to interpret as "the explanatory power of the system becomes bogged down in the details of the relationships" (Northcutt & McCoy, 2004, p. 176). IQA thus proposes mechanisms for further refining the SID, by removing all redundant links — any direct links which bypass mediating affinities.

To illustrate, in the Cluttered SID for this study, the 5 → 2 link would be considered redundant, because 5 → 4 and 4 → 2; the 5 → 2 link can thus be removed. Northcutt and McCoy point out that this does not imply that 5 does not influence 2 in a meaningful, and possibly direct way, but rather that one way in which 5 influences 2 is through the mediation of 4. Thus "by eliminating links that skip over mediating affinities, we achieve a simpler, more interpretable mental model — one that has optimum explanatory power" (Northcutt & McCoy, 2004, p. 177).

Following this process of removing all redundant links yielded the Uncluttered SID representing the participants' learning in the TC-infused tutorial programme[26].

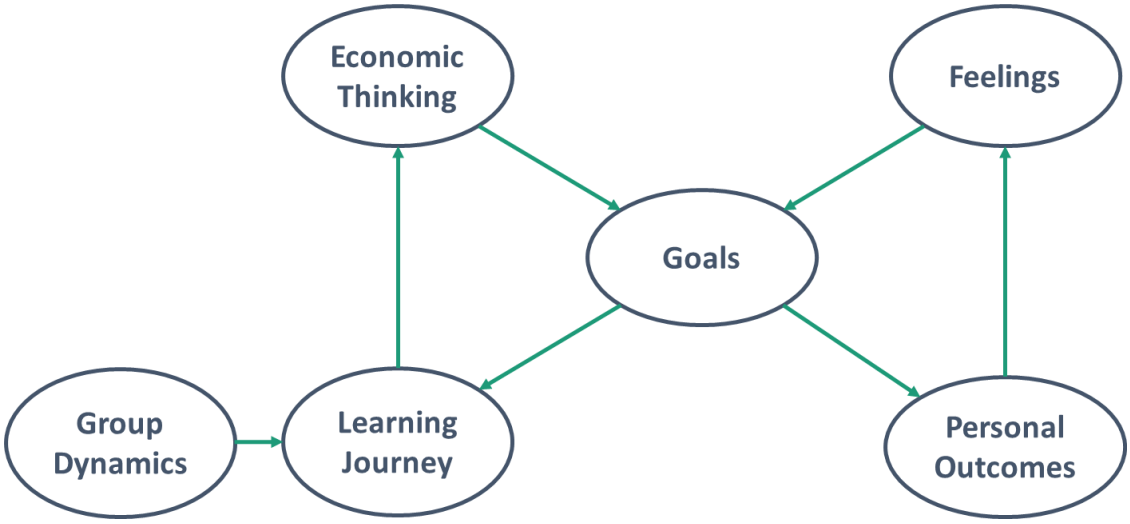

Figure 5. Uncluttered SID

5.2.4 A tour through the system

An interpretation of the Uncluttered SID serves as a verbal summary of participants' learning. The group dynamics in the tutorial sessions drove participants' learning in economics by influencing the two elements making up their learning journey: dealing with (conceptual) stumbling blocks and achieving successes, and learning about their

[26] The IQA rules for eliminating redundant links suggested that either 5 → 1 or 5 → 4 would be redundant; given the equal delta values of 1 and 4, there was no clear preferred candidate for removal. However, it turns out that removing either link yields the same result, because 1, 4, 3, 2 and 6 form a continuous loop such that the point of entry from 5 (whether it is 1 or 4) becomes immaterial, as explained in the discussion of feedback loops in section 5.2.5.

own learning processes. The learning journey brought about a shift to an economic way of thinking, which influenced participants' academic and career goals. Their goals in turn 'fed back' to affect the course of the learning journey. Participants' goals also influenced the personal outcomes they experienced during their learning, which affected their feelings. Feelings in turn shaped their goals. Two continuous loops are evident: from Journey to Economic Thinking to Goals and back to Journey; and from Goals to Personal Outcomes to Feelings and back to Goals. With Goals as the nexus, these loops of influence connect to form a figure of eight.

5.2.5 Feedback loops and zooming

Feedback loops "consist of at least three affinities, each influencing the other directly or indirectly" (Northcutt & McCoy, 2004, p. 335). Within a feedback loop, the driver / outcome distinction becomes irrelevant, since the affinities in the loop all influence each other. In addition to their independent meanings denoted by their individual names, the affinities within a loop also have meaning when considered together as a dynamic sub-system. "Zooming" in IQA entails naming feedback loops, and using these names in place of the individual component affinities, to create a less detailed view of the system for interpretive purposes (Northcutt & McCoy, 2004, p. 335).

Within the SID for this study, two (connected) loops or sub-systems were identified:

- Learning Journey, Economic Thinking, Goals
- Goals, Personal Outcomes, Feelings.

The elements of the first sub-system suggest a cerebral, cognitive, conscious process, so I named this the 'Head' loop. The second sub-system is affective, focused on emotions, personal growth and motivation, and so I called this the 'Heart' loop.

These "superaffinities" replace their components in the uncluttered SID to yield the intermediate "zoomed out" view (Northcutt & McCoy, 2004, p. 335) shown below.

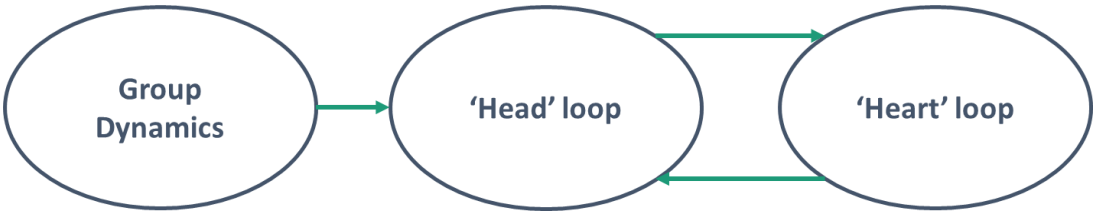

Figure 6. Intermediate telephoto view SID

Zooming can continue until a simple linear system is reached; this version, which cannot be further simplified and must comprise at least two elements, is referred to as the "telephoto view" SID (Northcutt & McCoy, 2004, p. 336). The 'Head' and 'Heart' loops are not a straightforward linear progression: because of the reciprocal feedback, these sub-systems can form a bigger recursive circuit which can be collapsed or zoomed out further in one more iteration of the SID:

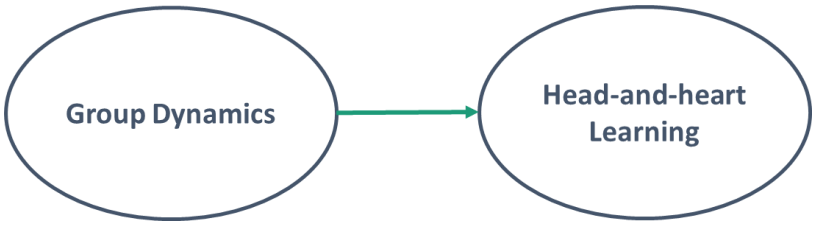

Figure 7. Telephoto view SID

This minimized linear view of the system, in terms of which Group Dynamics drives the composite construct I have named Head-and-heart Learning, cannot be simplified or zoomed out any further.

The SIDs at various levels of detail are drawn on in the representation and discussion of findings in subsequent phases of the IQA, and will be referred to repeatedly through the remaining chapters.

5.3 Concluding comments

This chapter has described the process and outcomes of the focus group phase of IQA as applied in my study. The participants generated responses relating to their learning in the tutorial programme, and drew on their thematic categorization of these responses to construct and name affinities. Their views on the relationships between these affinities were recorded in ARTs and I used these to compile the IRD, which formed the basis for the SID — a visual representation of the system as conceived by the participants. The saturated Cluttered SID was rationalized to arrive at the Uncluttered SID, from which I drew a verbal summary of participants' reality. Within this simplified representation, sub-systems or feedback loops were evident. These could be further consolidated or 'telescoped' to yield the simplest version of the SID, in terms of which the affinity Group Dynamics drives Head-and-heart Learning.

The representation arrived at through the focus group phase of the IQA reflects the reality of the group, based on consensus being reached through the group processes and protocols. The in-depth interviews that followed the focus group sessions elaborated the affinities and influences, uncovering finer detail and variation at an individual level. These descriptions are the subject of Chapters 6, 7 and 8, within which the SIDs and their constituent sub-systems will be drawn on in representing and discussing the emergent findings.

DESCRIBING INDIVIDUAL REALITIES: INTRODUCTION TO CHAPTERS 6, 7 & 8

The IQA focus group sessions described in Chapter 5 began the process of gathering students' insights into their learning in the TC-infused tutorial programme they had attended over the semester, and culminated in the representation of the group's responses in the form of the SID. The SID offers us a way of understanding the participants' learning, and is used as a structuring device for presenting the data in this study. The affinities and influences that emerged from the focus group and associated IQA procedures are elaborated in the following three chapters. All three present data at the same level of analysis: descriptions of individual reality, as expressed by the students in individual interviews and reflective writing, are provided to add depth and texture to the structure of affinities and relationships comprising the group reality. Given the range of affinities and the volume of description, I have structured these findings as three separate chapters, rather than one all-encompassing chapter, for manageability and ease of reading.

The descriptions in these chapters draw extensively on the participants' own words and are intended to be "as free from researcher interpretation and opinion as possible", giving centre stage to the data and adding to the credibility of the findings (Northcutt & McCoy, 2004, p. 302). The IQA guidelines for compiling these descriptions of results, as well as my departures from IQA protocol in presenting the findings of this study, are outlined in the following section. The chapters that follow present the composite affinity descriptions and the relationships of influence emanating from each affinity. Chapter 6 considers the primary driver: Group Dynamics. Chapter 7 moves on to the closely interconnected secondary drivers: the Learning Journey and Economic Thinking. Chapter 8 describes the system outcomes: Goals, Personal Outcomes, and Feelings. Chapter 8 also notes participants' insights on the systemic nature of their learning, as suggested by the Head and Heart loops — the sub-systems evident within representations of their learning as a whole. Significant findings that arise from these three chapters are discussed in Chapter 9 in light of the literature and theoretical perspectives that have framed the study.

IQA description rules

The IQA research process is delineated by specific protocols promoting rigour and replicability, and the description of findings is no exception (Northcutt & McCoy, 2004). To reach this stage, I followed the steps reported in more detail in Chapter 4, coding the transcripts of the 20 individual semi-structured interviews and the students' reflective writing. I assembled axial quotes for each affinity, and organized these into common themes to identify interpretive sub-affinities (which I have termed the 'elements' of each affinity in the chapters that follow). In the same way, following on from the theoretical coding completed by the participants in their ARTs, I compiled quotes regarding the directions of influence for the affinity relationships from the ARTs, interviews and reflective writing (the 'influences' of the affinities).

IQA custom entails presenting all of the axial affinity descriptions in terms of their sub-affinities, before proceeding to the description of relations of influence (Northcutt & McCoy, 2004). Perhaps because of the dynamic nature of some of the affinities identified by the participants in my study, I found that there was some scope for synthesis across these two categories. I departed slightly from IQA guidelines by including the description of relations of influence for each affinity immediately after describing its elements, which allowed for closer cross-referencing across 'elements' and 'influences', and seemed to enhance the coherence of the depiction of participants' meanings. In another modification to IQA protocol, I augmented the IQA-standard interview data with the inclusion of extracts from my own reflective journal. I also found that some themes arising in participants' reflective writing had not been explicitly included in the descriptions of the affinities emerging from the focus group. However, because these sub-themes could clearly be associated with students' meanings for one of the identified affinities, I was able to accommodate them as an element of the relevant affinity.

According to IQA procedure, the description of each affinity begins with an overview of the researcher's understanding of that affinity, highlighting her judgement of its most important features and making claims about it for which evidence will subsequently be presented. The IQA "Rules of evidence" (Northcutt & McCoy, 2004, p. 317–22) regarding punctuation, voice, structure, and editing are then followed for each sub-affinity:

- The description of the sub-affinity begins with a sub-heading which is a phrase (or sentence) that captures the essence of the sub-affinity. This is a direct quote (a participant's voice), and it reappears in the composite quote that follows.
- This is followed by a short explanation or interpretation of the sub-affinity in the researcher's voice, which contains an *italicized* key phrase.
- A much longer quote — indented and italicized — follows. This is in the voice of the participants; it is made up of numerous examples selected by the researcher, minimally redacted, and ordered so as to sound like one voice.
- After each composite quote, I have provided an additional paragraph summarizing the main points made by participants in the quote. (This is not specified by IQA presentation rules, but is intended to add clarity and create links to subsequent analysis by distilling the main features of each sub-affinity.)

The same format is used in describing the influences of each affinity. These sections begin with a partial SID, with arrows showing all of the relationships of influence stemming from the affinity that were included for analysis in terms of the Pareto Protocol (as explained in Chapter 5). The numbers on the arrows indicate the order in which the 16 relationships in total are documented. A brief description of each relationship, in my words as the researcher, summarizes the participants' explications.

The quotes that make up the greater part of the descriptions that follow are thus composites — multiple quotes that I have taken from many individual participants, lightly edited where necessary (for instance to remove any verbal distractions such as "like" or "um", or to standardize spelling in the case of written sources), and woven together to sound like one voice. Each can be seen as a tapestry made up of individual realities, at times revealing shades of variation within participants' shared understanding of their learning. Apart from the explanatory sentences and summary paragraphs, the description of affinities includes minimal interpretive commentary or evaluation from me as the researcher[27]: "Because the group is the best source of describing their experience, why not describe it purely in their own words?" (Northcutt & McCoy, 2004,

[27] This is not to deny the substantial researcher engagement involved in the identification of sub-affinities and compilation of quotes, however, as noted in Chapter 4.

p. 316). Chapters 6 to 8 thus do not entail further discussion in light of the relevant literature and theory, which is deferred to Chapter 9.

Composite affinity descriptions: Elements and influences

The descriptions in Chapters 6, 7 and 8 give a more detailed view of each affinity in terms of its elements and its links with other affinities in the system (as shown in Figure 8). The affinities are considered in descending order of delta[28], corresponding to a left-to-right reading of the SID, from drivers to outcomes of the system. Relationships of influence per affinity are likewise ordered according to delta values, to give the reader a sense of the overall placement of the affinities in the SID (Northcutt & McCoy, 2004). Chapter 6 describes Group Dynamics, the primary driver of the system of participants' learning. Group Dynamics comprises multiple sub-affinities, and influences all other affinities in the system. The Learning Journey and Economic Thinking are closely entwined secondary drivers in the system, and are elaborated in Chapter 7. Chapter 8 considers the outcome affinities — Goals, Personal Outcomes and Feelings — as well as the participants' views on the systemic nature of their learning.

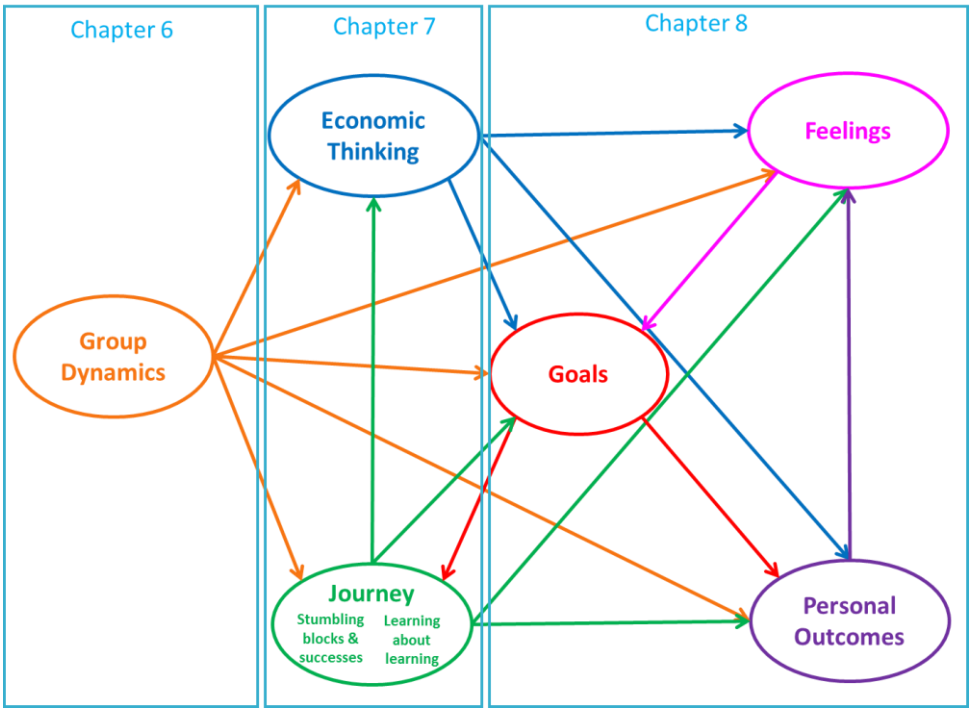

Figure 8. Affinity descriptions in Chapters 6, 7 and 8

[28] Recall from Chapter 5 that a higher positive delta value signals that an affinity is a 'driver' in the system, while a negative delta denotes an 'outcome'.

CHAPTER 6
INDIVIDUAL REALITIES: GROUP DYNAMICS AS A DRIVER OF STUDENTS' LEARNING

6.1 Introduction

This chapter, the first of three detailing the meanings that students ascribed to the affinities identified in the focus group sessions, presents Group Dynamics. The Group Dynamics affinity is the primary driver of the students' learning as reflected in the SID constructed from the group's inputs, as explained in Chapter 5. Group Dynamics drew prolific responses from the participants, both in the focus group and in interviews, and was found to influence all the other affinities. The relative complexity of the Group Dynamics affinity, the volume of data pertaining to it, and its position as the only primary driver in the SID, warrant its being the subject of a chapter on its own. The following sections describe Group Dynamics in terms of its constituent sub-affinities or elements, and depict the ways in which it influences each of the other affinities. In a brief departure from IQA procedures, I supplement these with short extracts from my own researcher-tutor reflective journal, before concluding this chapter. Taking the same approach, Chapter 7 considers the secondary drivers — the Learning Journey and Economic Thinking — and Chapter 8 elaborates the outcome affinities of Goals, Personal Outcomes and Feelings. Deeper discussion of the findings of all three data chapters is related to existing literature and theory in Chapter 9.

6.2 Group Dynamics

Group Dynamics emerged as the primary driver in the system that constituted the focus group's learning of economics concepts over the semester. Group Dynamics encompasses all the qualities and processes that defined students' interactions during the weekly tutorial group sessions,[29] and that they saw as impacting on their learning of

[29] In the focus group, a few of the response cards grouped under this affinity were about the format and content of tutorial tasks; in the interviews, participants spoke almost exclusively about the group processes per se in response to questions about the Group Dynamics affinity. To a large extent the tasks and processes are intertwined (the tasks required structured discussion that triggered many of the group

economics. The very name the participants chose for this affinity signals that it is not a static concept: active processes that occurred within the group define it, and constitute the 'engine' that drives the other affinities and energizes the system. My analysis of students' views on Group Dynamics yielded nine interpretive sub-affinities that captured the students' meanings for Group Dynamics:

- a growing sense of solidarity;
- seeing peers as an important resource for learning;
- attaining greater understanding;
- building understanding through exposure to multiple perspectives;
- the power of talking to effect learning;
- group processes that validate students' thinking and build confidence;
- opportunities to socialize;
- a safe and supportive environment; and
- developing shared disciplinary understanding and discourse.

These are described in turn in the pages that follow, with composite quotes to illuminate each. The section thereafter gives an account of how Group Dynamics, through these constituent sub-affinities, influences each other affinity in the system of participants' learning. The first part of the discussion — section 6.2.1 — focuses primarily on intra-group processes themselves, leaving most of the description of how Group Dynamics influences the other affinities for section 6.2.2. However, given the dynamic, process-comprised nature of this particular affinity, the standard IQA distinction between what it is (the elements or sub-affinities it comprises, i.e. axial codes) and how it affects other elements in the system (theoretical codes) was not always easily made, and at times the description of sub-affinities strays into considering directions of influence.

processes). In these write-ups I have chosen to reflect the emphasis that emerged from the interviews, so that comments about the nature of the exercises (e.g. real-world, applied, structured) will be considered under the Learning Journey affinity.

6.2.1 Elements of Group Dynamics

6.2.1.1 I realized that I wasn't alone in 'the economics struggle'

Interactions within the group eased students' initial self-doubt and anxiety, and fostered *a growing sense of solidarity* as they realized that their experience of difficulty was shared by others, and that they could help each other learn economics.

At first I didn't feel quite confident or that happy when I entered in the group, because most of the time when you're studying alone and facing some stumbling blocks, you might feel, I'm a failure towards this. I'd always sit there and think, it looks like everyone gets it except me - is something wrong with me? In the beginning I was nervous and anxious 'cause I thought everybody else knew what they were talking about and I'd be the one saying, OK guys, what's the answer for this? In the beginning I did feel (I wonder if I should say this… ok) less than average with my intelligence towards economics. But now when I get to work with other people, I can see I'm not alone in finding difficulty in this: there are many of us, and from that we can work as a group and try to solve whatever we are facing as a group, rather than just being alone and feeling defeated. As time went by I found that I can ask them, if I think they know more and I don't know something, it's good to ask and acquire the knowledge. And maybe there's something that I know that they don't know. That's how we feed off each other, so that's how I learnt from the group dynamics. Because now you're not by yourself, you're not dreading like, oh no I don't understand this, I won't get this. I think I learnt a lot of things from the guys in the group - content related things, social things. I realized that I wasn't alone in 'the economics struggle'! So being in a group helped me realize that there are other people that understand, and I don't have to do it all on my own. I can sit with someone and we can navigate around problems together til we find a solution.

Many students admitted to doubting their own abilities in economics, or feeling that they knew less than the others in the group, causing them to feel anxious or intimidated at the outset of the programme. In noting this point in my own reflective journal, I added "I'm surprised at how many of these were stronger students who had seemed like confident contributors in the group and ended up passing well …" (21/3/2015). Once they had begun to work together, they were relieved and reassured to realize that others also found aspects of the subject difficult, and that feelings of self-doubt and anxiety were not abnormal. The group offered a safety net in that participants could reveal their insecurities without risk. They discovered that they could learn from other group members, and could also contribute to their peers' learning. Feelings of dread and defeat were replaced by a sense of shared difficulty and the possibility of tackling — and solving — problems together.

6.2.1.2 Friends who are really intelligent people

Through interaction in the group, students came to see their *peers as an important resource for learning*, who could be approached as equals and sometimes as role models.

> *We're all doing eco's, we all related in the TC tuts, and if ever I wasn't sure about something I'd then ask my colleagues. Some of the stuff, a few of us had a similar problem. And then you find one person, they knew what was going on, so then that person used to explain it to three of us - and then that was the problem solved. We'd gone over it with friends who are really intelligent people. I learned people actually will tell you something, they actually will know, and sometimes, some people understand better: like Thando, she understood elasticity better than I did so she was able to explain it to me. And had I sat on my own I still wouldn't know it. There was a chance where it wasn't the lecturer telling us what's going on. It was like getting information from someone who was on the same level as I was. So if they found something difficult, they could explain that.*

> *Whereas you [the lecturer] don't know what I find difficult; or the words that you use are different to those that people my age would use… Where I might think that something is difficult, but then you'd think that everything is easy! Whereas my friend could also think that something is difficult, and think the same thing I'm thinking; but then you [the lecturer] wouldn't know. Everybody seemed like they knew more than what I did, as we went on, but then I didn't mind because they helped me. If you're in a hockey team and you're maybe the amateur or the rookie, you see the good players and you want to learn from the good players, so that's how I felt when I was in the group; I've seen some good group members who are succeeding in economics, I saw Ace, then I decided I want to learn more from him, see what he's doing. So that's how the group dynamics helped me the most - it was just being around the guys who already have it.*

A sense that they were united by some common factor — be it their youth, or status as economics students, or members of the study group — allowed students to relate to each other immediately. Participants recognized that explanations offered by peers in the group were an effective route to understanding concepts they were struggling with. A peer who has recently understood a concept would be well placed to clarify it; she would be likely to have a better understanding of the sources of their difficulties than the lecturer, and would explain in familiar, perhaps informal, language. For some, their peers' willingness to help seemed to come as a surprise. The sense that group members were on the same team and shared a common status, although they might have different strengths, made it relatively easy to approach and learn from them.

6.2.1.3 In the group, I got understanding

Students recognized that working in groups brought about *greater understanding and more effective learning* than attempting to memorize large volumes of content while studying alone.

> *I actually learned more in the tuts than I do by myself. I hadn't really realized how well I could work in a group, and how that actually helped me so much in this module especially. Because by myself I learn the coursework, the content, but not so much the understanding of it. I can take everything in without understanding it – I can cram everything up, and just put it in my brain without understanding it. But then in the group I got understanding. So I learnt more in the group than I did with the book. We discovered that we were more efficient working in groups and we were very good at that, other than working on our own with our self only.*

The notion of understanding was a common thread which was discernible in the participants' elaborations of most of the affinities. In their interpretations of Group Dynamics, students associated understanding specifically with group interactions and processes. This was contrasted with the individual, text-based rote learning most had been using. For many, the effectiveness of this new approach to learning was a revelation.

6.2.1.4 Having people explaining different views, it comes together and forms an entire picture

The means by which students reached this greater understanding in the group centred on their hearing various explanations or interpretations of economic concepts from peers. Students found that this *exposure to multiple perspectives* in group discussions helped them to build, complete and assimilate their own deeper understanding of economic concepts.

> *There were some areas that were very hazy, and when someone would just be explaining it when we were having those discussions you'd get a clearer vision, you see, because sometimes when you just read stuff by yourself you miss out some important points. But then when you're*

having that group discussion, somebody might bring out what you missed, and then it all comes together to build one puzzle. Not that you've got it wrong, they've just got something to add on. So you think your point is just right, that's how it is; but then someone comes with a different idea to you, but it's still right, but then it just adds to what you're discussing at the moment - basically just makes it all well-rounded, so you've got different ways of explaining and analyzing a specific topic. If they understood what you said in our lecture, then in our groups they would say the same thing but they would maybe come at it from a different angle or they would use different words. So now I find all these people in the group would try to bring in how they understand it, and then, somewhere along the line, I'd pick up – oh, ok, this is how you do it! Having people explaining different views, it comes together and forms an entire picture that I could assimilate and come to understanding oh, ok, this is how it works as opposed to that, and why. Having different people's points of view of how to tackle the thing, you pick up the things other people are doing, and how not to do it, and you're kind of building your own view of how to do the actual thing. Bringing different individuals' understandings into my own helped me build my knowledge on whatever topic we were discussing - reflecting all my thoughts on them, and them giving back whatever their thoughts are on what I'm thinking, helped me to really… deepen my understanding. In a group I get to see how others relate to the same concepts, how they think of certain concepts rather than my thinking about a concept, so it's helped me to be in a group, to understand the concepts and be able to apply it on my own now rather than waiting to hear what someone else has to say.

Students relayed how hearing a range of different explanations of concepts from their peers enabled them to reach understanding. In describing this process, they often used visual images — such as a hazy view becoming clearer, or a puzzle being completed. Their prior understandings may thus have been vague or incomplete; alternative perspectives also helped to identify incorrect understandings. In making sense of the

various perspectives offered by the others in the group, students were able to construct and complete their own individual understanding (some used building imagery to convey this), which they could internalize and apply. This promoted a sense of self-reliance.

6.2.1.5 When you speak, you're learning

Students noted the *power of talking to effect learning* as they worked on tasks in groups: the process of verbalizing in itself served to create and refine their economic understanding, while discussions also allowed them to check and correct their conceptions and their use of the language of economics.

When we start to talk about things, that's when I comprehend and understand things. I wasn't getting it, I wasn't understanding it. And then thanks to the TC group, I was able to just talk about it. It was like – I don't want to say 'rehab', but it was like you were able to just talk. I'm using economic language, and it helps me explain so then I make sure that I'm explaining it right! I felt there was more learning in the group, because if I said something, somebody else would comment on it, and if I was wrong they would correct me, and if I disagreed I would explain my case, and then in the middle of it I'd find – oh no wait, that actually doesn't make sense – I think he or she was right. I'm ready now to go and study with other people, communicate and share stuff, share ideas. Because when you share, when you speak, you're learning, and then you also get the opportunity to talk, and see how it's going, if you're right. Because if you're all alone you don't know sometimes – you think you're right but you're not, maybe. When you're studying something it's better when you're explaining and when you're trying to talk, so that you get that you're understanding the thing.

The opportunity for students to speak and express their views or understandings of economic topics was a novel experience provided by the group. Participants found that understanding could be reached or deepened through the process of expression in itself. In the course of speech and discussion, students could check, revise and correct their conceptions, as well as their use of economic discourse.

6.2.1.6 I learnt to trust my mind

By providing opportunities for them to evaluate their own understanding, group processes served to *validate students' thinking and build their confidence* in their abilities.

> *The group dynamics was really beneficial to knowing what I do know and what I don't know, and what I need to know and what everybody else knows. I discovered that some of the things that I actually thought of were helpful, they were useful, and you could find that some of my colleagues were thinking in the same direction that I was thinking. I learnt to trust my mind. If I think of something, I'm never sure if anything is right, because I never check or get backup or anything. But in the group I learnt that actually, some of the things that I think are correct some of the time: I just didn't have confidence in my understanding. As time went by, for all of us, the more we got to know each other the more confident we were, the more able to analyze stuff in the workshops and the exercises. Sharing ideas with other individuals actually boosts your self-esteem as well as your own self-image. This group has given me so much, and among those is the ability to believe and trust myself. It's amazing to see how much you have learned when you put it into practice.*

Students could assess their understanding and benchmark themselves against others in the group. This was a source of affirmation of their knowledge and abilities, which

strengthened their sense of self-efficacy. Together with increasing social confidence, this fostered greater engagement with the conceptual content of the group exercises.

6.2.1.7 The social aspect (wow, it was nice)

Many students enjoyed the *opportunities to socialize* and to get to know and develop friendships with their peers that were afforded by the tutorial groups, which they contrasted with the anonymity of mainstream, large-class lectures.

> *When we walk into the lecture rooms we don't get to interact that much. It's very anonymous, just in and out, do your bit, go write your tests, ja, that was it. So in the tut group it was easier to interact with other people, get to know them on a more personal level. So I actually enjoyed that. The social aspect – wow, it was nice… getting to know people and learning their characters… and you know it breaks all the barriers that may be around. As the group continued we were trying to understand each other's personality, how each person works, what he likes, what she doesn't like... so we shifted view from 'what am I trying to get out of it?' to 'what can we get out of it but together, as a group?' In class you'd just be meeting and sitting, but then when you're put in a group set-up you get to know the individuals, how they are, and you get to understand them and you get to create friends. I loved it, I made new friends, people I never thought I'd ever talk to!*

The small class and group interactions stood in stark contrast to the impersonal and functional environment of mainstream lectures. In the tutorial groups, students made connections with their peers as individuals, which fostered a sense of belonging to a collective.

6.2.1.8 It felt like home

The group tutorial sessions provided a *safe and supportive environment* as students felt comfortable with each other and overcame feelings of insecurity.

> *It felt like home actually. It's just like home in the TC groups. It really felt like I was at home so it took away this shyness inside me and made me expose some of my weakest points. You know, if I wasn't there I would have been shy to expose them, but just because this got like home, it didn't really much make it a barrier for me. At first it was very quiet… and then you made the environment very friendly and comfortable. And we're all young and then it's very easy to communicate between us, because you don't feel very like – apart, if I can say? It's like your world is there. For a shy person like myself, it got me to open up and be comfortable with people I see every day on campus but never speak to. I also have a problem of raising my hand in class, I never do that because I feel so intimidated – like I said I'm so reserved – so in the tut I became more comfortable and more outspoken. So you realize that ok, I'm actually growing and interacting with more people, and I'm no longer afraid to really expose more of the way I think and how I am. I come out of my shell when I'm with people I feel comfortable with. Then I'm pretty much exactly what I was in the groups. We were like a family.*

The sense of comfort, safety and trust in the groups, which some students likened to 'home' and 'family', eased their participation. Many overcame their shyness, or their reservations about exposing potential weaknesses, and felt able to speak and interact freely with their peers.

Or, by contrast:

6.2.1.9 It was not that comfortable for me

Unlike the majority, two students remained *uncomfortable with group interaction*.

> *I think it did help, but it was not that comfortable for me. Working with people that you are not – that you don't know well – that was not cool. I think I was there more to listen than to do anything else. Because I'm a reserved person. I don't know how to express myself when I'm in a group. I feel comfortable working alone. And I fail to defend something that is too obvious because when I present an idea, I think that the other person understands what I'm saying without having to further explain. So it's things like that that held me back in interacting with the guys in the group. Plus the other thing is the language barrier. Basically, I can write English, I can put it on paper, but having to communicate by speaking … ja… if you can just write, write, write then I'm fine. I'm fine communicating ideas, I can teach, I don't mind teaching. But it's having I think everyday conversations.*

These students found the tutorials helpful, but felt uncomfortable interacting with and expressing themselves before groups of people they did not know well. They attributed this to their reserved dispositions. One student noted that his tendency to hold back was compounded by his reservations about speaking English in an unrehearsed, conversational context (unlike writing, or prepared speech, about which he felt more confident). Both of these students continued attending the programme, perhaps at a higher emotional cost than most, presumably because they found the sessions beneficial.

6.2.1.10 Our own forum as economists in the making

Students shared a common purpose and felt that they could relate to each other in the group as they *developed shared disciplinary understanding and discourse*, and this enhanced their learning and enjoyment in the tutorials.

> *It got me excited that I can share my views with likeminded people who share the same interest in economics. Because it wasn't just a group for any other module or something – it was for economics, what I love and what I hope to further, so it was also helpful in terms of my studies. Because you just want to surround yourself with people with the same goals as you, and that's how you get better. So within the group we share the same ideas and when we are thinking like this, we know what we're actually talking about. When we talk with some concepts, we're able to relate - this boosts my economic thinking; say we just get to talk about opportunity cost, she understands what opportunity cost is, I also understand opportunity cost. Attending the TC was like having our own forum as economists in the making… I mean the people you can relate with, the people who can understand your language and not question the terminology you use, and people who can encourage your level of thinking and who can just bring out the best in you.*

The sense of an emerging disciplinary identity to which some students alluded recurs in several of the other affinities. It was expressed more strongly, though not exclusively, by students intending to major in economics. As a component of Group Dynamics, it found expression in common factors that encouraged participants to identify with each other as economics students: shared interests and goals with regards to studying economics, and a common understanding of economic concepts and language. These commonalities boosted students' motivation and facilitated their learning.

6.2.1.11 Synopsis: Elements of Group Dynamics

This set of complex interactions that together constitute the Group Dynamics affinity may be pulled together as follows. As the group was created and took shape over the semester, students' initial feelings of anxiety and self-doubt dissipated. Students were reassured by the realization that they were not alone in experiencing difficulty with the discipline. As they worked together, they formed friendships and increasingly came to

see each other as resources they could draw on in their learning. Group discussions prompted by the tutorial exercises allowed the participants to hear multiple and varied explanations, which helped them to construct their own deeper understanding of concepts. In parallel, speaking in the groups proved to be a powerful means of creating, correcting and completing their understanding. Both of these learning mechanisms were enabled by the group environment: a safe, friendly and supportive space where students could test their understanding, talk freely and practise new disciplinary skills. They developed a sense of disciplinary community as they shared their understanding of economic concepts and discourse. The group interactions served to validate students' thinking and built their confidence in their abilities. Students recognized that their learning of economic concepts in the group was based on understanding, and that this approach was more effective than the solitary, text-based rote learning to which most had been accustomed.

6.2.2 Influences of Group Dynamics

Taken together, the qualities and processes described in the previous section constitute the participants' construction of the complex and powerful Group Dynamics affinity. As the primary driver of students' learning, Group Dynamics is a strong causal factor that directly influences all five other affinities in the system (as shown in Figure 9). Many of the mechanisms of influence are apparent from the descriptions of the sub-affinities in the previous section. The ways in which Group Dynamics directly influences each other affinity are elaborated in the following sub-sections[30], drawing from students' completed ARTs, interviews and written reflections. Influences are presented in descending order of delta (i.e. from affinities that are stronger drivers to those that are stronger outcomes in the system), as shown in the numbers on the arrows.

[30] This discussion only considers direct relationships of influence; affinities might be additionally influenced by Group Dynamics mediated through the other affinities. For instance, Group Dynamic influences Goals not only directly as described below, but also through its influence on the Learning Journey and on Economic Thinking. These mediated impacts will be captured in the subsequent discussions of each affinity and its relations of influence.

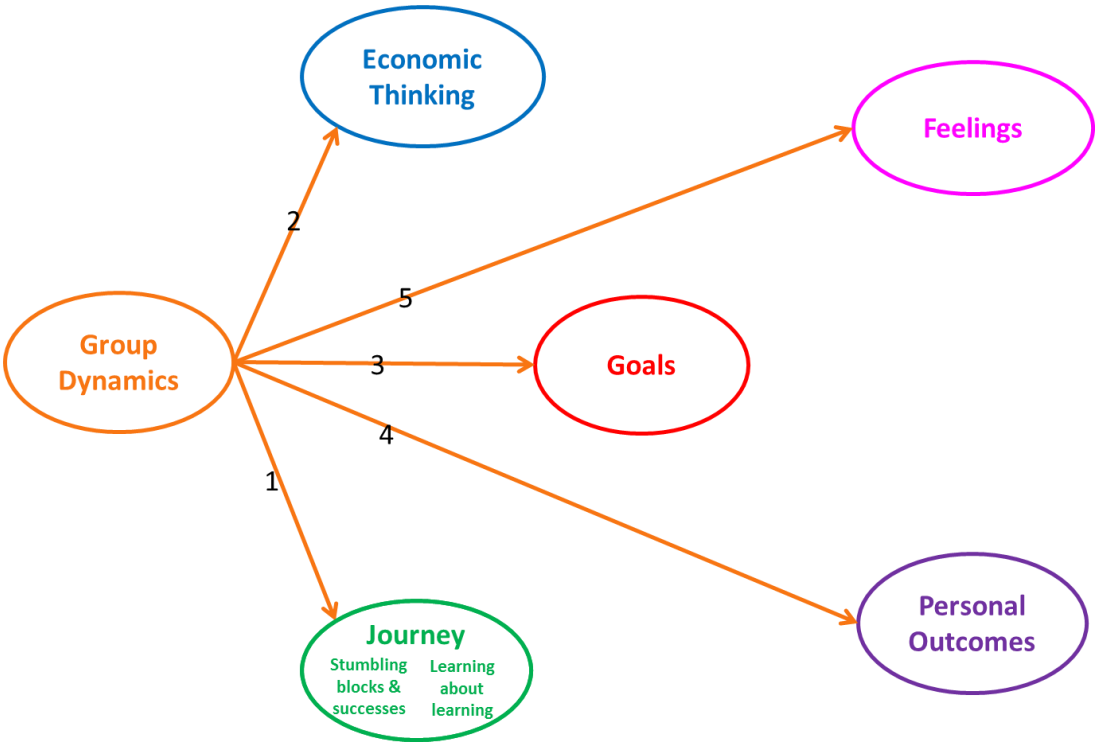

Figure 9. Influences of Group Dynamics

6.2.2.1 Group Dynamics influences the Learning Journey

Interaction within the tutorial groups facilitated learning by providing solidarity and support, and by promoting processes that helped students move through stuckness and towards understanding.

> *Group dynamics helped in making my journey more easy and smooth. Because knowing that everyone or at least almost was experiencing the same feelings like me, helped in making things easier. [You are] not alone in the battlefield, have brothers and sisters to pick you up when eco's shoots its elasticity flaming arrow at you. Being in the group helped me to realize that I will not just know everything, and by this helps to relate to others. The group dynamics, the discussions and being open to … having that friendly environment and interacting with others, it also in a way determined your journey. Because if maybe you weren't that much interactive, then you'd have lots and lots of stumbling blocks. But if you interacted as much as the others*

interacted, then the journey would be … smoother, that's the word, yes it would be smoother. The group dynamics encouraged you to be outspoken and it encouraged your thinking and sharing of information. Group dynamics would create instances that would result in the journey through learning, making mistakes and understanding. Explanations in the tuts helped the journey - the different views helped with understanding difficult concepts. The group is what made the journey, because every time we met we learnt something new and understood things better.

Group Dynamics directly influenced both cognitive and affective elements of the Learning Journey (which in turn comprised *Stumbling Blocks and Successes* and *Learning about Learning*). Knowing that others shared their experiences and feelings helped students to tolerate incomplete understanding and the unease attached to learning new concepts. The friendship of peers provided emotional support through the challenges of learning. In the comfortable and supportive environment that emerged, the group processes that brought about conceptual understanding — exposure to a range of explanations in group discussion, and being able to verbalize one's own understanding — were facilitated.

6.2.2.2 Group Dynamics influences Economic Thinking

The group work in tutorials helped to create and enhance the requisite disciplinary understanding that enabled a new way of thinking.

Discussing as a group helped me start thinking like an economist. The group and my participation affected my economic thinking because with them I got to understand economic concepts and improved my economic thinking. Group discussions helped me a lot in developing my knowledge in economics and also in the way I see the world. When working in a group you learn to look at situations in different perspectives; arguing a point helps one understand. When you in a

group, you get to see other people's insight about how they think or approach economics. I learnt how to apply some economic concepts from my group members, helped me understand competition during games, I thought like an economist to maximise my gains. Group dynamics have influenced economic thinking 'cause you get different opinions from different people and you get a different perspective and you're like, oh, I didn't think of it that way. You get to view how economists operate in the outside environment. So with us, we were doing it in a very conservative environment, but at least we got to have a picture of how it happens in the outside environment.

The cognitive processes brought about by the group, together with a sense of common purpose and disciplinary identification and a safe learning space, encouraged students to embrace new perspectives and practise their developing disciplinary way of thinking.

6.2.2.3 Group Dynamics influences Goals

Interactions in the tutorial groups encouraged students to believe they could reach their goals for the module. Being part of a group and sharing a common purpose motivated them to understand and learn.

When we worked together during the programme, it gave me hope that I would excel in economics. Communication with [the tutor] and listening to what my peers think has been really helping me see that my goal is attainable. The things I learnt in group discussion motivated me to learn more. As a group, subconsciously [we] had to decide to make this a success or not, participate or not and we did, because that was the goal. My goals [were] in line with that of the group. i.e. understanding. Not understanding something or struggling – it can go one of two ways: either I'll completely leave it out – but I think having the group there gave me that enthusiasm to want to really understand it. Working in groups sometimes creates

competition or the need to succeed seeing the achievement that other people have acquired.

Students' sense of self-efficacy was bolstered by interactions with peers and the lecturer: group processes helped them to self-assess and to grow more confident about their abilities to do what was required to achieve their academic goals. Group interactions also seemed to favour the setting of goals emphasising understanding — an important feature considered in more depth in the description of the Goals affinity in Chapter 8. Self-belief and motivation were reinforced as students realized they were making progress in their learning. Being part of a group with a common purpose provided further motivation, as peers served as competition or inspiration.

6.2.2.4 Group Dynamics influences Personal Outcomes

Students' Personal Outcomes encompassed both intellectual and personal development; the elements of Group Dynamics directly furthered both.

Working in groups helped me understand economics more and pass my tests. Interacting with others helped me to improve on my knowledge. Working in groups is amazing, I love it, I've learnt a lot, and I want more. Being in group discussion… made me open up to new ideas (mind opener). The things I learnt in group discussion improved my confidence. Using the group as a platform to express your ideas and grow as an individual. The way I interacted with the group has made me more confident and less shy. And the group dynamics encouraged me to be outspoken and to have confidence in myself. I engaged, and made some friends. I learnt to be a better listener and to consider the views of different people. I got to understand myself and how I work in a group. It is because of the group dynamics that I was able to grow personally and achieve these personal outcomes.

Group processes built students' economic knowledge, interpersonal skills, and self-awareness. Participants found that their interactions in the tutorials had also boosted their self-confidence in social and academic contexts, expanded their social circles, and generally led to a sense of personal growth.

6.2.2.5 Group Dynamics influences Feelings

Feelings of belonging, confidence, and greater enthusiasm for economics were directly evoked by students' participation in group interactions in the tutorials.

> *Being in a group made me feel at home. The group dynamics would cause feelings to arise such as self-awareness, sense of belonging and understanding as group dynamics created an environment of learning. I loved the TC group, the way we learned. I'm going to miss these people, all of them. Group discussions help through understanding and indirectly motivating each other. All knowledge I received in group discussions caused me to be very happy. The group tutorial set-up brought about feelings of enjoyment and excitement toward learning together. Sometimes group discussions would get rather heated. Working in groups makes me feel confident, because now I can express myself with no fear. The TC group showed me I shouldn't be closed off or afraid to voice out my emotions and be confident when talking about eco's. Being in the group helped to improve my feeling by being able to express myself of which this give much confidence. The group dynamics and discussions have increased and reaffirmed my feelings about economics in general. Brings about a positive feeling to economics. Group discussion - that's when you realize that you actually love eco's and you want to pursue it.*

Participants linked Group Dynamics to a range of positive feelings about others (the group), themselves, and the discipline. They noted a sense of belonging, feeling at home and attached to their peers; and the learning they attained through group processes

brought enjoyment, excitement, and happiness. Increased self-confidence and self-expression, both socially and in their economic understanding, was noted under Feelings (as well as being a Personal Outcome as described above). For many, more positive feelings towards the discipline of economics resulted from group interactions and processes.

6.2.2.6 Synopsis: Influences of Group Dynamics

To summarize, the characteristics and processes of Group Dynamics directly influenced every other component of the participants' learning in economics over the semester. Group Dynamics served to advance the students' Learning Journey, by providing both cognitive and affective support for their learning. The cognitive processes that were fostered in group discussions, together with the sense of an emerging disciplinary identity, encouraged students to embrace new perspectives and practices and thus come to develop Economic Thinking. Group Dynamics impacted on students' Goals: interactions in the tutorials boosted their sense of self-efficacy as they came to see goals as attainable, while being part of a group with a common purpose provided further motivation. The group processes also contributed directly to Personal Outcomes by building students' economic knowledge, interpersonal skills, confidence, social resources, and personal development. Positive Feelings about themselves, the group and the discipline were directly evoked by group processes.

6.2.3 Some observations from my reflective research journal

This section departs briefly from IQA protocol to include some extracts from the reflections I wrote as researcher-tutor over the semester of the tutorial programme. The impressions I recorded from this perspective clearly align with the participants' views regarding the novelty and apparent effectiveness of the group discussions in the tutorials:

The time flew & it seemed everyone had fun. It was also a bit of a revelation for me – seeing 'social constructivism' at work as they

talked their way to knowledge & solutions in their groups, productive buzz, everyone seemed to be participating & mostly getting it (14/8/14).

On the last set of reflective submissions: They really credit the group with learning, which is GREAT – there's not much of me, lots of 'learning from the group', the class discussion etc. I find myself slightly surprised that this works so well – after years of 'jug & mug'! (20/8/14).

Classroom game with chocolate money, then team game. Everyone fully engaged & into it… Real group vibe going now, personalities, teams, jokes & teasing & they seem relaxed with me ... I'm learning so much too (17/9/14).

Yesterday's tut was good – I was anxious about it being boring after the excitement of the last one, but the class had a vibe & energy – maybe happy to see each other after the break? ... Lots of fun, laughter & energy & hopefully some learning about externalities (2/10/14).

[After preliminary analysis] Something that is likely to be big: the group learning is huge; and yet that wasn't ostensibly what I set out to investigate – the tut group was a vehicle for exploring their learning wasn't it? In the run of the mill mainstream class context we don't use groupwork at all. Yet here it emerges as the primary driver. Shared construction of knowledge. So there are huge implications for how we teach (22/12/14).

My observations paralleled the participants' comments about the enjoyable, engaging and effective nature of learning in the groups. Within the large undergraduate economics modules, attempts to foster active learning and greater engagement in this way were as novel to me as they were to the students, and I shared the surprise many of them had expressed at how well they seemed to learn in this way.

However, from my perspective the notion of students learning from each other was tempered by a concern that they might need additional guidance towards the relevant

analytical approach in discussing the tutorial exercises. I noted a tension between keeping the discussions appropriately focused, and not undermining the cooperative learning approach that required students to reach answers together:

> *I was a bit concerned about that aspect [trying to avoid 'teaching' when facilitating plenary discussion of answers] - & trying to 'guide' & make sure they don't misinform each other, without standing up & teaching or positioning myself as the one who knows the answers! (20/8/14).*
>
> *The groups were working well – I circulated as they were discussing as I could hear one student leading his group down some not-so-relevant avenues, but with a couple of nudges they were back on track (28/8/14).*
>
> *Great to see Glad getting the multi-market price discrimination diagrams perfect & explaining them clearly. She is a confident contributor & it was good to be able to leave explanation to the participants & not re-teach anything (10/9/14).*
>
> *I hope I wasn't 'teaching' too much with the matrices – but I don't want any mis-understandings / misconceptions clouding things when they get to this in lectures (17/9/14).*

These ideas sound a caution to be borne in mind in the design and management of group-based learning opportunities, but they do not detract from the importance of Group Dynamics as understood by the students.

6.3 Concluding comments

Many of the findings discussed in this chapter — the meanings students ascribe to the Group Dynamics affinity, and its influences on aspects of their learning — do not refer explicitly to economics, and might apply equally to group interactions and processes in other disciplinary contexts. Nonetheless, the role and composition of Group Dynamics provide insights into the nature of disciplinary learning that have a bearing on current

debates around teaching and learning in economics, and add depth to our understanding of learning from a threshold concepts orientation.

Perhaps it should not be surprising that Group Dynamics emerged as such an important theme, given the way the tutorials were structured around group discussion. Some of the elements and influences of Group Dynamics may be seen to correspond with much of what learning theorists already know (and economics lecturers have tended to ignore). However, the description of Group Dynamics adds to our understanding by pointing to some mechanisms of learning that seem to work well in the disciplinary context of economics, and in the more specific context of the case study. It also begins to reveal the importance of affective aspects of learning, and how these can be supported by peers. Economics — especially at introductory and intermediate levels — has a characteristic and more or less universal pedagogy that caters to little of this. At a higher level of abstraction, findings around Group Dynamics may suggest some larger questions about pedagogy and power. These ideas will be returned to in Chapter 9.

According to the TC view of learning, crossing conceptual thresholds requires that learners traverse a liminal phase of possible confusion and uncertainty, as their old ways of viewing the world are transformed. Learning encompasses both cognitive and affective elements, and is entwined with learners' social and emotional contexts. A central question in TC-oriented enquiry is how students come to reach conceptual understanding and make the liminal transition. The above findings suggest that one means by which they may do so is through group discussion, because it promotes learning in dissectible cognitive and affective ways.

Group Dynamics in the TC-infused tutorials offered cognitive support for students' necessary conceptual development: they came to see peers as an important resource for learning, and in group discussion attained deeper understanding of economic concepts through exposure to multiple perspectives, and through their own articulation. Affective support came in the form of a secure and nurturing learning environment, and a growing sense of solidarity and community as 'economists in the making'. Students' sense of self in the context of the discipline was strengthened by group interactions that validated their thinking and built confidence, and by the development of shared disciplinary understanding and discourse.

These findings will be revisited in the light of existing literature on learning in economics, particularly within a threshold concepts orientation, in Chapter 9. Next, Chapter 7 elaborates the secondary drivers within the system of students' learning: the Learning Journey and Economic Thinking affinities.

CHAPTER 7
INDIVIDUAL REALITIES: THE LEARNING JOURNEY AND ECONOMIC THINKING

7.1 Introduction

In this, the second of three data chapters, the participants' understandings of the Learning Journey and Economic Thinking affinities are elaborated. Both are secondary drivers in the SID describing students' learning that emerged from the focus group processes, and the meanings ascribed to these two affinities are closely linked. As secondary drivers, the Learning Journey and Economic Thinking affect the rest of the system, and they are directly affected by the processes and interactions of Group Dynamics as described in Chapter 6.

The structure of this chapter follows that of Chapter 6: the Learning Journey and Economic Thinking are each described in terms of their constituent sub-affinities (or elements) and their influences (in the order indicated by the numbers on the diagrams) on other affinities in the system, in sections 7.2 and 7.3 respectively. I then offer some concluding comments pointing to issues that warrant further attention in the discussion of these findings (together with those of Chapters 6 and 8) in Chapter 9.

7.2 The Learning Journey

The Learning Journey, with its implied movement towards a destination, describes students' progression in learning economics through the module and tutorial programme. The Learning Journey comprises two broad sub-affinities identified by the focus group, and thus proceeds along a double-track path, where students' *Learning about Learning* continues as they encounter *Stumbling Blocks and Successes* on the way to disciplinary understanding.

Following the procedures described in Chapter 4, I analyzed students' interview transcripts and written reflections, and identified the following sub-affinities:

- finding difficulty with the volume and pace of mainstream lectures;
- recognizing that they took a deeper approach to learning in tutorials;
- the value of the tutorial exercises for building conceptual understanding;
- moving towards understanding of economic concepts as a dynamic, complex, challenging process;
- feeling stuck as part of the learning experience;
- possible routes through stuckness to understanding;
- understanding of particular concepts or techniques as breakthroughs that brought clarity;
- issues around assessment;
- growing awareness of the role of personal academic histories, attitudes, and learning practices.

Each is described further in the following section, which again relies primarily on composite quotes to reflect the participants' meanings.

7.2.1 Elements of the Learning Journey

7.2.1.1 Putting all the information in my head in such a short space of time

Students faced challenges arising from the *volume and pace of a traditionally lectured course.* The standard approach to first- and second-year economics teaching may unintentionally inculcate a superficial approach to learning, where students 'cram' and memorize content in order to pass, rather than fully engaging with and understanding concepts.

> *Sometimes it gets confusing if you learn something, and then you just learn another thing; it's been a very challenging module and it needs a lot of time, a lot of reading and a lot of understanding. The theory became a bit tricky for me - putting all the information in my head in such a short space of time… In first year I'd say everything was new to me, a different environment, everything was just happening so fast*

that most of the time you weren't learning to understand a thing, just learning to get a pass and just getting on ok. Just having lectures the whole time and then being tested… a lot of it is just memorized stuff more than it's really knowledge. I was just reading, memorizing before the test or exam. We're studying just to pass, not to learn. It seems like we're just being bombarded with a whole lot of information that we must just remember and get past and on to the next step. And it felt like a huge waste of time, I'm coming here for three years to learn stuff that I'm not going to remember!

Students found it difficult to master the volume of course content, with new ideas having to be learnt in quick succession over a relatively short time. In the face of the volume of information they were required to know, many students resorted to memorizing with the aim of passing tests and exams, despite their recognition that this was not "*really knowledge*" or true learning, which they saw as being based on understanding. This recognition was discouraging and caused concern. Some participants noted that these problems had been more severe in their first year, when they were still acclimatizing to the new learning environment and developing their study approaches. However, the difficulties associated with rapid lectured coverage of extensive theoretical content persisted into second year and Econ 202.

7.2.1.2 Learning economics in a deeper way

Students recognized that their approach to and attainment of learning in the tutorial programme was different: their learning before had been partial or superficial, whereas they now sought to understand the reasons underlying the theory in *a deeper approach to learning*, which improved their grasp and recall of content.

In terms of economic concepts, I can say that I knew stuff, but then I didn't totally know them? I just knew the word – maybe you can say 'opportunity cost' and, I'd think, ok well I learned that last year; I'd seen already, it's just that I didn't fully understand. Maybe I

understood the theoretical part and not the actual application. Once we started learning and discussing it during tuts, I was able to differentiate. For me learning economics in a deeper way helps me a lot in understanding and also applying economics into the real world we live in. I need to know why the theory applies as it is. Not just saying, 'this is the theory and that's about it'. For me that's the only way I can understand it now – when I know why. Working through the examples is good because you can see where things come from. The graphs - one needs to have an understanding first, then memorize the shapes. Then being able to draw the graphs, it just automatically happens. Learning how equations are derived - people would say, 'no man, you just memorize them, and you'll be fine'. But I can't do that. I'd sit in the test and can't remember what this equation is, because it just didn't make sense… So this semester I'd go and I'd read and look at how these equations were derived, why the graph looks like that. I think it's part of the background knowledge, that helps to build on all the other stuff. Then I can unpack it and get to whatever it is that I need to do, as opposed to just remembering things. And I've seen that when you understand stuff also you don't take that much of time writing, 'cause things are just flowing. If you understand something, just given a scenario you can quickly get the gist of saying, ok ok ok, this is what needs to be done. Unlike when you try and drag it from somewhere, I thiiiink it's this… When it came to the actual exam and studying for it, I basically understood, so it was pretty awesome. And then being in the classroom was so much more enlightening, I'd go sit in class and I'd understand what was going on.

Participants noted that they had encountered many of the concepts covered in Econ 202 (and the tutorials) in their first-year economics courses, but regarded their prior understandings as incomplete, often associating their newly acquired, deeper understanding with the ability to apply concepts. The need to understand the origins and rationale for theoretical ideas, including their algebraic and graphical expression, was emphasized. While there was a recognition that economics requires some drill work

including memorization of equations or graphs, students were aware that this should be meaningful memorization based on a sound understanding. This was distinct from unquestioning attempts to memorize without understanding that participants had taken in the past. Concepts understood in this deeper way were more readily recalled, facilitating identification and application of the relevant concepts or techniques to a given scenario, and allowing for quicker composition of written responses. Conceptual understanding also eased students' exam preparation, and enabled them to follow lecture content more readily, which motivated increased attendance.

7.2.1.3 We were looking at different real life situations and applying those concepts

By prompting and structuring group discussion, the tutorial exercises *embedding economic concepts in relatable, real-world applications enabled deeper conceptual understanding* than students were attaining in conventional lectures and workshops.

> *In the tut group we were looking at different real life situations and applying those concepts. I like that because it doesn't feel useless, it doesn't feel like a whole bunch of knowledge that you can't do anything with. These concepts of supply and demand or economic models in general are taught to us in such a way that we can't relate or apply them in a real world situation. And I think with more real world based cases like the YDE example, my grasp for economic models and concepts can be solidified. Because in the tut we'd go over examples and scenarios and we'd share our thoughts; then in class [lectures] we were just learning theoretically, and you'd show us an example… This one game we played in the tut, … it was easy for me going through that chapter. I've played the game so I know what was happening… that's how I understood it. It's different from the tuts we usually have; there you have to do questions and leave, that's all, we have to just come to check if we did it right or wrong. I think the short questions actually helped break down the understanding. Instead of just trying to think, 'what am I going to write in this*

paragraph?', it's short enough: this is the core of what they want from me, I'm going to take the answer from that. And then that same logic, or same way of doing things that we applied in the tut group, I actually applied with my studies. And I discovered it helps a lot. The tut for me was useful - even though we were not dealing with new concepts, we got to practise the concept which has made me more informed about the topic.

The participants confirmed the effectiveness of the ETC-based exercises (Davies & Mangan, 2006c) and the classroom games used in the tutorials[31]. Features of the exercises that students found especially helpful in promoting their understanding and recall of concepts included the use of real, relatable examples, and their own immediate involvement in tackling the problems (or playing the games) — in contrast to lecture presentation, which was more theoretical and abstract (even when it included examples). The way in which the exercises were structured — scaffolded, built-up questions beginning with a focus on identifying the relevant concepts to use in the analysis — helped students to develop analytical skills, because they were guided through successive steps in analyzing cases and could then apply the same approach when working on economic problems on their own. Together with group discussion, the structured questions also helped students to identify mistakes they had made along the way. The conjunction of understanding and the ability to apply concepts is suggested by the observation that tutorials allowed them to practise the concept — an idea also noted in the description of the first sub-affinity (*Learning economics in a deeper way*) above.

7.2.1.4 I'm kind of getting it now

Learning in the tutorial programme entailed a shift or progression in students' understanding of and approach to content; *moving towards understanding of economic concepts was a dynamic process* which took time, sometimes brought confusion, required repeated efforts, and was not always completed, but was recognized as positive change over the semester.

[31] These are described in Chapter 4 and listed in Appendix 5.

As I engaged in different learning areas and techniques, I got to be more familiar and I got to get the hang of those very concepts that are tricky, elasticity and those market types, equilibrium. Elasticity still tricks and confuses me, but I'm kind of getting it now… it's still something that I need to work on, keep going over and over. I think it was the Greyhound question, that's when I began to question my understanding of elasticity, because I was thinking that I understood it! I'm still not good – I'm still trying to get there – I'm not crystal clear on it – I'm still trying to (laughs; sighs) … It's in my understanding; that's all I can say. And elasticity – it's one of the things I probably carried on since first year; understanding of it is like – ja, it takes time. I'm realizing that repetition is better than reading it once, I realize the more I manage my time the more I explore the concepts. I think before the exam I'll be fine. Last year mostly when we were looking at the graphs, I didn't know what was cooking. But then we started going deeper into the graphs, and now I understand it a little bit more. It's like a learning process. I think it will get better as time goes by. Starting from the beginning, then now – the changes, even in my studying, I've changed a lot. Now I'm more focused on understanding exactly what it is and applying some content while I'm studying. If I look at my work since we started this semester I see that I have really improved and my confidence in economics is growing well.

Participants described how their understanding of certain concepts (e.g. elasticity) and techniques (e.g. graphs) had progressed, and their study approaches had shifted towards emphasizing understanding and application. They expressed an increasing sense of self-efficacy as they observed their own progress. Nonetheless, this was not a smooth journey. Learning sometimes involved confusion and anxiety, and caused them to question their ideas of concepts they thought they had understood. Students noted the need to practise and go over things repeatedly, and found that reaching understanding often took time. Many felt that their understanding of particular concepts (notably,

elasticity) was still work-in-progress; however, their comments mostly reflected a sense of tolerance of this state of partial understanding, and optimism that they would "*get there*" in time.

7.2.1.5 I don't understand this thing!

For many students, part of the learning experience *involved feeling stuck (terminally or temporarily)* on a concept, with economics generally, or with a study approach. Some students felt that they had not managed to move beyond this stuckness, which inflicted a high emotional cost. Some described stuckness with reference to disciplinary content:

If you say something 'clicks', like you get it – I don't know if in economics I have got it; I don't know, I feel like something's missing, there's something I'm not getting... I don't have that 'aha moment'. Economics, I just have those glimpses. I honestly cannot explain economics! Graphs still elude me to this day; ask me to calculate something and I will do it faster than the speed of light, but ask me to derive a curve and I become clueless. Graphs are to me what kryptonite is to Superman. All those economics graphs that I've done since first year – I don't know how I got through economics like that, to pass. As far as the modelling is concerned, I'm not really clued up on it. I don't understand how you can just take two variables and then get all of this information off the graph, I feel like it's just getting sucked out of someone's thumb. Holding things constant is where my issues lie. Looking at two factors to decide on something is crazy. I know the problem for me is the graphs themselves. I think I have basic understanding of them and what's the use of it, but when it comes to I have to shift them and use them, apply it to the question, it's almost like a different story, it's like - ok I'm getting caught out, uhhh, I don't know what to do. I don't really get elasticity because I know there are different kinds of elasticity, inelastic demand and whatever, so (laughs)… yes… something stretching…. Ok maybe, if you increase

> *the price, you want to see how consumers would respond, I think that's elasticity… ? If you change the prices and whatever? The thing is – I don't really understand it! So I'm still stuck. And now I just cannot differentiate the unit elastic - ahaha - inelastic… I just cannot differentiate between the kind of elasticities.*

Some participants expressed a general sense of "*not getting*" economics that had not been resolved by the end of the semester (despite their having been registered for at least four semester-long economics modules by the time of the interviews, and having passed at least Principles of Microeconomics). Some identified specific concepts or techniques that they had remained stuck on, particularly applying modelling techniques (simplifying, holding variables constant) and graphical analysis, and elasticity; a few spontaneously offered conceptual explanations that revealed their incomplete understanding.

Stuckness might also manifest on a metalearning level, in the form of persistence with ineffective study approaches:

> *During my last years of study I was a kind of loner student and usually sit down with the textbook and then study, study, study, and when I had a problem I studied some more and studied some more… I couldn't, I couldn't, I wanted to actually consult but I couldn't. Last semester I had a bit of a breakdown before my exam, I spent one day just sitting, I couldn't read any more, because I was thinking, I don't understand this thing! I just really did not understand what was going on. And I just switched off and I was just so depressed the whole day, I just sat in front of my books and I didn't do anything. Moments like that, I'd always think that ughhh, I must be stupid or something, I really don't understand what's going on.*

Participants described how repeated attempts to read and study the textbook on their own failed to deliver them from stuckness. Stuckness induced strong emotional responses: participants referred to feelings of powerlessness (Superman confronted with

kryptonite), frustration, depression, desperation, and evaporating self-belief, which might lead to withdrawal (emotional or literal) from their studies.

7.2.1.6 I'd find different ways of trying to understand

For the majority who experienced stuckness as temporary, a main route through stuckness to learning involved making *efforts to find alternative explanations of problematic concepts* (from peers, tutors or lecturers, online sources or other textbooks).

> *Let's just say economics as a whole I was not sure of. But then we had the one tut on elasticity, and everybody was explaining their understanding of it, and then drawing the graphs, and saying it's elastic this way and that way… and then for the reflections I asked one of my friends… and he was explaining what each thing meant as we went on. So I think that helped. I didn't quite really understand it, up until I went to Chris [a postgrad tutor] and when we were working around he explained and I got it, it was ok… Speaking to someone else actually helps. When we were doing it in class, it was actually like oh, ok, joining what Chris was telling me, and what the other peers were also saying, and what we were discussing now as the whole of the group, it was making sense, it was becoming more clear. If it's something that I don't get or I don't understand in other books in the library, then I consult [the lecturer]. I'd go and find YouTube lectures or whatever I could find, just to re-explain it to me, and find different sources as well. So I'd find different ways of trying to understand. It actually improves the way you think for yourself. Because – you know, when you are thinking on your own there is a particular time where you sort of, you've reached the break point, where you can't go further than that. But then when somebody comes in and enlightens, then you become able to think more about it, around it, and then you expand the capacity of how you understand certain things.*

In a similar process to the 'multiple perspectives' described under the Group Dynamics affinity in Chapter 6 (section 6.2.1.4), obtaining alternative explanations of troublesome concepts from a variety of sources could assist in overcoming stuckness. This required initiative and conscious effort on the part of the students, both in terms of time (watching relevant online videos, finding and reading other textbooks, or speaking to peers or staff) and emotional demands (overcoming fear of embarrassment and reluctance to ask for help). These alternative explanations enabled them to escape the ruts of their existing understandings and habitual ways of thinking, and expanded their ability to think and understand.

7.2.1.7 Understanding <u>that</u> was a revelation

Reaching understanding of certain concepts or techniques was felt as *a breakthrough which brought clarity*, enabled students to see connections and grasp other concepts, and led to a changed view of the course content and of real-world economic phenomena. The concepts or techniques with which participants most frequently associated this type of breakthrough were opportunity cost, graphical analysis, marginality, and elasticity.

> ***Opportunity cost:*** *That's when I realized it, when I was sitting there doing the football exercise - that you look at the opportunity cost of picking this player; then I realized that you don't only look at future costs… I didn't really grasp what it meant until this year. That was the one where I had my aha moment, when it came to the opportunity cost. I had a huge problem with opportunity cost: well, English is my third language, so at first I used to translate this phrase, this word, in French as an opportunity that a person gets. So then, when we were using it in the tut group, I thought, ok, this is not what I was thinking actually, it's something else. I was studying it last year, but then I just didn't know what it means exactly, and now it's just a big relief 'cause this word, we're using it so many times in economics. I can't believe I passed Economics 101 without really knowing 'opportunity*

cost'. It broadened my understanding of the economic way of thinking, I mean the fact that to make a simple football club decision such as buying or transferring a player requires the decision maker to consider economic concepts such as opportunity cost and scarcity of resources was… let's just say I never thought of it that way. I felt like economics just became alive. All those concepts or principles, less input, more output, opportunity cost, costs versus benefits were suddenly making sense.

Despite having reached their second year of economics study, some participants realized during the tutorial exercises and discussions that they had not properly understood the idea of opportunity cost. For one student, for whom English was a third language, the misconception arose from translating the phrase into French. Having corrected their understandings, the participants expressed relief and surprise; some alluded to the pervasive and fundamental nature of opportunity cost, which impacts on everything else in economics — which subsequently made more sense.

***Graphical analysis:** I had a huge problem with the **graphs** – how to explain the graphs – but now it makes sense. I can draw the graphs now while studying. I can just show the same thing on the graphs. That's the thing, 'cause in eco's it's graphs, graphs. So that was a huge thing. So now I'm ok. There were lots and lots of different graphs, but then when looking at it, it's like the same thing, but applying it differently. Especially I loved the graphs, because it made the picture clearer. I prefer using graphs than theory, than notes and writing. You can say that ok, if this happens, these are the consequences, and you can just explain the whole thing using only the graphs, once you know how to use them. One of my biggest successes – I know it seems stupid, but it was when I figured out the price in the graph, the price does the quantity and it doesn't shift the demand. But now it does that with a whole lot of other things, I think – real wage rate also does the same thing: it also changes the quantity and doesn't*

*shift. So understanding **that** was a revelation and I was happy to understand that. And I can take that into the next course and even next year. We were just used to the multiple choice, it's a huge difference for me when it's time to draw the graph [for myself] … because this time you're able to interpret better, because now you know why.*

Understanding and being able to use graphical representation was a source of difficulty for most participants (as noted in the discussion of stuckness above). Participants who succeeded in mastering the use of graphs expressed relief and joy, recognizing that this was a crucial and pervasive disciplinary technique that would enable them to advance. Once grasped, graphical representation could give students a clearer view of economic cases, and offered a powerful alternative way of expressing economic ideas. Participants recognized the wide applicability and transferability of graphs, noting that the principles learnt in a particular context could be applied to different examples and in other economics courses. Having to construct the graphs for themselves, instead of being presented with a pre-drawn diagram, clarified the reasons for particular features of graphs and thus enhanced their understanding.

***Marginality:** I never understood what **marginal** anything meant! It was just 'marginal'. It was a concept that was in almost everything, but I never understood what it meant. I don't remember what exactly made me get it but I remember I got it in class, and I told my friend, 'OOOOH, so that's what that means!' and she said 'ya-a-ah' (laughs). And I'd ended up just learning that there's something called a margin, and you must just know that if it says 'margin', this is what you must do and your graph must look like that, and that's about as much as I'd known about a margin until now – it makes so much sense now! Because it's a concept that's like in almost everything, so I get more things now. Like for instance where you're talking about marginal utility - I didn't understand it from last year, I only got it now; I don't know how I missed the definition, but it is the **extra** thing*

> *that you get, not the whole thing, but just that little bit extra* ***is*** *the marginal utility. When we use the demand and supply curve to understand the marginal benefit and marginal cost, this caught my attention because the demand and supply curve I have always looked at in isolation, and also took the marginal benefit and cost curve in isolation, without realizing that these concepts are one and the same thing. I started to look at the demand curve not as a line that reflects the relationship between price and quantity demanded, but maybe as an aggregate of the marginal benefit curves of every consumer of interest. So I think now I have an understanding of what goes on when we're deriving the demand function at a fundamental and abstract level, without the econometric techniques and all of course, but the theory before the mathematics.*

Some participants described reaching an understanding of marginality and its application, for which they had previously relied on algorithmic rules — "*if it says 'margin', this is what you must do*" — rather than understanding. There was a sense that the meaning of marginal seemed obvious in hindsight, once they had grasped it; and because it is in almost everything in economics, finally understanding what marginal meant enabled them to make sense of many related concepts. Some participants articulated a changed perspective and deeper understanding of demand and supply curves, once they had interrogated marginality in relation to the derivation of those curves.

> ***Elasticity:*** *Elasticity - I was kind of embarrassed when I got the hang of it. The thing is a very easy topic, but when you look at it in a way that I looked at it before… well I can't even actually identify the way in which I looked at it. But once you start getting why it's there and why it's important and how it works, you tend to use it – you tend to remember it and use it without knowing, like the equations, you put it in, you know what's going on. My understanding of elasticity has definitely changed because this is the concept that I can relate to*

other concepts, and at first when it was introduced it was the concept that I didn't get to understand at all. Elasticity seems to be everywhere. I now understand that it is a major determinant of profit maximization. One cannot talk about demand and not put its elasticity into play - it is automatic. I got to see that it's something that is also applied in everything – that's probably why some concepts are a bit hazy, because with elasticity I've seen that you can't choose – it seems like all of the concepts actually you apply elasticity inside. Elasticity seems to be a concept that you cannot do away with in economics: you have to befriend it so that your understanding of certain theories or concepts can be made easy. In first year it seemed as if it was this strange animal that just made life difficult, but now I can see it clearly in my day to day life. I even understand that it is the main reason why firms discriminate on price, so as to capture people who are more sensitive and hence make profit. I think when I got the gist of really what market power was and what it was all about, that was also one of the most interesting aspects of all the concepts that we learnt. So now with understanding that, understanding why firms use certain price schemes – it would just click, like a window breaking in my head, like ok, wait I've seen this all my life!

Elasticity was frequently mentioned when participants reflected on topics they had found difficult or been stuck on. When first encountered, elasticity could be an alien concept whose meaning seemed to elude many. Students recognized that this was a pervasive concept that was connected with many other concepts or theories — and which would remain hazy until a proper grasp of elasticity enabled understanding of those other ideas as well. Recognizing concepts or principles in the context of their application in the real world (in the case of elasticity, with regard to analyses of market power and price discrimination) facilitated understanding and recall. This understanding in turn gave participants new ways of viewing real-world phenomena.

> ***An economic point of view**: And you get to understand ok, so people's reactions around this is because of the same. So… you'll be understanding the reasons why they're doing whatever they're doing is because of the concepts that we've been learning! And I think that would ultimately help me with my understanding of the world in future. I think with time you can – you know if you start to see – like if this fog is just being lifted, then you can see how everything is working out, and see how things work. After everything, after the dust has settled, things come into place, like a jigsaw puzzle, so it's like I understood everything. I knew what I was doing, instead of being a hopeless mindless person trying to absorb as much information as I can. When I look at most everything I do, I am now privileged to be seeing the concepts scattered everywhere, which is so fascinating. For me to look at everything from an **economic point of view** is making everything around me become interesting to analyze. For me it's not anymore just a course, it's more than that: seeing myself in an economic world, what kind of decisions should I take?*

Taken together, the microeconomic concepts students learnt gave them a new way of seeing the world and understanding and explaining behaviour. They expressed a sense of increased clarity and a changed, coherent view of reality, using the metaphors of fog lifting, dust settling, or a jigsaw puzzle being completed. This brought a sense of personal competence and agency — knowing what they were doing rather than merely trying to absorb information. Participants recognized the relevance and applicability of concepts they had learnt to the real world at large, and to their own individual lives.

7.2.1.8 I know what works for me (or not)

Students' *self-knowledge of their personal academic histories, attitudes, and learning practices* clustered around two polarities: traits and techniques that had a positive impact on their learning, and a recognition of ineffective or unhelpful behaviour.

One of the things that makes it easier for me to understand is that I have always wanted to be an economics expert, but I was lacking good learning styles and also encouragement, and these were caused by the poor school where I had some teachers that were not very good in teaching, and others that even fed us with a lot of discouraging words so that we will perceive ourselves as failures. I realized that in life there are things that a person must discover for him[self], do not depend too much on people, be decisive and do things that you think must be done. I tried to forget about things that were discouraging me. I did Economics 202 in 2012; I failed [because] I had a problem with Maths, I didn't do Maths at school. So I decided to study high school Maths. I studied it on my own. [So then] it was easy to understand the equations and the graphs and so on. I had a problem with most of the stuff last year and I managed to go back and re-read what we did last year in [Econ] 101. So I think that paved the way for 202 - I sorted it out, so I came here with a clear mind, a clear head. I used to have this fear of going to ask about something; I think I have started now practising it, even to the lecturers. I use a textbook, I make summary notes, and if there are diagrams I try to sketch them without looking at the textbook. I learn by attending classes and then I read. I like to write my thoughts down. I know what works for me. It's one thing I've discovered, the best way to learn for me I think was to read books on related fields, watch videos on YouTube about the history of economic thought to get more grounding of the theory. Practice helps. Sometimes you read a concept and you want to try it out. I've seen that I used to do this habit of cramming stuff… and not getting to really understand what is happening in this situation. This year I got to see that no, you really need to understand stuff… I got a new technique of studying, I discovered that working in a group and discussing things also helps, rather than studying on your own. I learn better when I work with people, when I listen and reason with them. I learnt to listen; I learnt to work in a group; I learnt to make

simple examples. And I also learnt that when I don't understand something I must get the basics first.

With regard to positive impacts, participants offered a range of insights into their own learning — some long-known to them, others newly discovered. Common to all of them was a sense of agency, the attribution of successes to their own efforts, and of facing challenges in their learning with self-belief and a plan. One participant described how he had overcome the negative legacy of his school experience and even taught himself high school mathematics to enable his own further learning; another had revisited the first-year syllabus to clear up problems and pave the way for second-year studies. Taking responsibility for one's own learning might also mean overcoming a reluctance to approach lecturers for help when necessary. The techniques described showed participants' recognition that a certain amount of drill work and practice was required to master the subject, for instance reading, summarizing, working through revision questions and practising drawing graphs. Participants were willing to spend time and effort on these techniques, as well as on a wider engagement with economics, through further reading or watching online videos. The shift from memorizing to understanding as the basis of their learning was a crucial insight for many, as was the effectiveness of collaborating with peers.

Other participants showed an awareness of the negative attitudes and habits that were undermining their academic success:

I've realized that when I learn, I can spend too much time - I never really get to practising what I had studied and never got to doing past papers because I simply run out of time. Moreover, I never finish studying the prescribed chapters for tests and never meet deadlines such as attempting the workshop question before the workshops, and this has negatively affected my learning in economics. Procrastination – that's me. Doing things at the last minute, the night before! So I don't think that's changed. I think that's the problem – I'm still getting through, so why change? I passed my matric with A's so I got to first year, I thought to myself, I know the work, I aced it in matric,

> *so maybe I should put [just] enough effort; as result I wake up in the supplementary exam room and wonder how I got there. I also have learned that I learn better if I take my time, learning in advance not putting off things for the last minute, but somehow I find myself trying to cram the work five hours before the test, and what I reap is indeed what I sowed. I studied for about straight 30 minutes then counted the number of pages… this demotivated me… So during these low esteem moments I'd catch a series one episode [that] would lead to two [and] before I knew it I finished the entire season; after that I feel tired so I sleep. The circle continued until it was test time. My only problem is I really do not give myself enough time to master or learn or study my material, but I will fix that in due course.*

Not apportioning time appropriately was common to these difficulties. For some this was simply an issue of how they divided their study time across sections and skills, and could be readily addressed once identified — for instance, by reducing the emphasis on the detail of some sections and instead allowing enough time for practising, completing readings and attempting workshop questions. Other participants recognized their difficulties as symptomatic of deeper problems around motivation, pointing to their own tendencies to procrastinate and then perform below their potential. This might reflect a lack of interest and motivation beyond simply passing the module — "*I'm still getting through, so why change?*" Another participant, frankly describing his limited study efforts and self-admitted underperformance in economics, linked this to a sense of complacency stemming from his strong academic results in high school. His unproductive study habits diminished his motivation and self-esteem; yet his awareness of his habits of avoidance had not freed him from their grip.

The final element of the Learning Journey concerns assessment. Before proceeding to participants' words on this element, it should be noted that assessment did not emerge directly from the focus group responses, but was the topic of some written reflections and was mentioned by most participants in their interviews. I have included it as an element of the Learning Journey since it seems to fit best with this affinity. While participants' comments on their performance suggest some important insights, they

must be read with caution. Most of the written reflections in this regard were elicited early in the semester — only three weeks into the tutorial programme, and soon after the first test, on which overall performance was very poor. Interviews were held before the year-end exam, so participants did not reflect on their final performance (although they had by then completed the series of tutorials and written all three class tests). There is a strong suggestion from the interviews[32] that, for most participants, their performance in assessments improved over the semester. Their comments about Test 1 thus need to be seen in context.

7.2.1.9 When it came to the test I couldn't reflect or apply my knowledge on paper

When it comes to assessment, simply 'knowing the work' from attending class and learning notes is not enough to ensure good performance. Many participants performed badly on the first class test in particular, and offered a range of explanations for this.

> *I was very much scared of the test before I wrote because of the fear of the unknown. I knew all of these things but I didn't write them down, 'cause I think I panic a lot… so I must just be calm. I studied well, but when it came to the test I couldn't reflect or apply my knowledge on paper, the time was so little for me, and it stressed me a lot, because I wasn't thinking any more of writing the right thing but finishing the whole paper. I spent all my time on my difficult question and I lost marks for it. The language plays a role in my progress. In a test or exam room when you are faced with time constraints and you really have to finish quickly, it really challenges, for example with the essay questions where you have to write neat and clear for the marker. Secondly, the writing format / answering format: I am a Science Foundation student, [so] I'm used to the science way of doing things like approaching a question and answering. With economics, it has its own way of thinking and answering which needs to be learned.*

[32] The study had no intention to gauge the impact of the tutorial programme on learning in a quantitative way; any insights to be drawn rely purely on students' own reflections on their learning. It might have been useful to corroborate this with more detailed analysis and evaluation of their assessed work.

> *I found that the time frame for the test was quite short and I think this was due to the fact that I've never done any [economics] questions in written form. The way in which the questions were phrased made it difficult for me to fully grasp or understand what was expected of me. Well the main reason of a bad performance was time and also a lack of understanding of the relevant concepts. Also throughout the whole module I need time to understand the concepts and to gather my thoughts. There are many concepts that I find confusing A LOT! Especially if it has to do with calculations. I still need to understand labour-leisure choice on the graphs.*

Many of the difficulties participants pointed to were associated with the assessment format: in first-year economics, all assessment took the form of multiple choice questions, whereas in Econ 202 more emphasis is placed on problem-based questions that require students to construct their own answers in the form of short written explanations, calculations and/or graphs. Some expressed anxiety around the unknown format; many noted the time pressure as a contributing factor to anxiety and felt they had not allocated time efficiently during the test, spending too long on questions they were struggling with. Participants recognized that the types of questions and the approaches required of them in answering were specific to economics, and some were unsure about what was expected of them. The written questions meant they had to use language to convey their understanding clearly for the benefit of the markers — a challenge that was heightened by the time pressure. For some, the calculations were the main source of difficulty. Others identified specific topics or concepts that they had not fully understood, perhaps because the pace of the course had not allowed enough time for them to reach understanding. As a result of these factors, many struggled with the assessment and obtained disappointing results, despite initially feeling that they had studied well.

The comments of participants who did well in the first test offer a useful counterpoint:

> *My performance was very good, and yes, it was a fair indicator of my effort because I worked very hard and probably over time as well. I*

would say first and foremost the revision we did in class played an important role in clearing some trouble or unclear areas. Also the past papers really help in showing me the format in which the questions come and also the format in which to respond. The test was good for me because I got the platform of applying my knowledge of the concept without having to choose for the best answer on the MCQ. But there were parts where I didn't understand like where we had to calculate MRS - I kind of got lost there a bit. I was quite nervous as it was a written test (actually to be honest all kinds of eco tests make me nervous) but something that helped me quite a bit was before the test my friends and I had a small study/explanation session, and it was real exam or test questions that we were working through, not just the lecture slides. Going over the past papers for test 1 was something that helped me pass because in class we don't really do test-like examples. If I could say it like this, we're taught how to make rice in lectures and then are expected to make breyani in the exams.

Participants who had performed well attributed this to their own efforts, the study techniques they had used, and the knowledge and skills they had mastered. Clearing up confusion and ensuring sound understanding was an important starting point. The written test format requiring that they construct their own answers to problem questions could be favourable to students who had mastered the relevant concepts and could bring this understanding to bear verbally, algebraically and graphically, since it offered a "*platform*" for applying their knowledge. The students who fared well also felt anxious about assessment, and also identified questions they had not managed to answer. In explaining their success, they pointed to the effort they had put in — much of which had been focused on practising questions from past test or exam papers. This form of revision and practice was most helpful because it familiarized them with the question format and the expected way of responding. Lectures generally did not include worked examples of past questions, which were seen to be more challenging and complex than simply repeating the content conveyed in class — rice being a single ingredient, simply cooked, while breyani requires the selection and skillful combination of a multitude of ingredients to create a more complex and substantial product.

7.2.1.10 Synopsis: Elements of the Learning Journey

The extensive content and rapid delivery pace of large-class courses such as Econ 202 can leave students feeling overwhelmed. Some resort to a superficial, memorization-based approach to learning in response to the volume of content, in the face of insufficient time to develop deep conceptual understanding. By contrast, the tutorial programme allowed students time to engage with concepts, and the format of the tasks — structured discussion around concepts embedded in relatable, real-word applications — promoted a deeper approach to learning, which enhanced their grasp and recall of the content. Over the course of the semester, students moved towards a deeper and more complete understanding of economic concepts. However, the progression in their understanding of and approach to economic concepts was not always direct or straightforward — it took time, entailed periods of uncertainty and confusion, may have required repeated attempts, and was not always completed. Feeling stuck on certain concepts or with regard to economics in general was a common element of the learning journey — these were 'stumbling blocks' that imposed heavy emotional costs. Overcoming them and moving through the stuckness to 'success' or mastery required that students invest time and effort to find alternative explanations (from peers, teachers, texts or online sources). Reaching understanding of particular concepts (most frequently, opportunity cost, graphical analysis, marginality, and elasticity) was felt as a breakthrough that brought clarity and a new perspective on the course content, and sometimes on real-world phenomena as well. Students' growing metacognitive consciousness — their *'Learning about Learning* — included greater self-knowledge and awareness of how their academic histories, attitudes and habits affected their learning journeys. It also included a recognition that learning based on understanding and tied to application of concepts was distinct from the partial or superficial approaches they had used before. Nonetheless, conceptual understanding in itself was not always sufficient to ensure good assessment performance. The poor results of many students in the first class test in particular (despite having believed themselves to be well prepared) was strongly linked to the requirements the questions made of them — applying the concepts and principles they had learnt, and conveying this understanding using verbal explanations, graphs and/or calculations. Students felt that practising the

type of analysis required by working through past papers was an especially effective strategy in preparing for tests and exams.

7.2.2 Influences of the Learning Journey

The Learning Journey was a secondary driver in the system — a substantial and extensive affinity made up of (conceptual) *Stumbling Blocks and Successes* as well as (metacognitive) *Learning about Learning*. The Learning Journey influenced Economic Thinking, Goals, Personal Outcomes and Feelings (as shown in Figure 10).

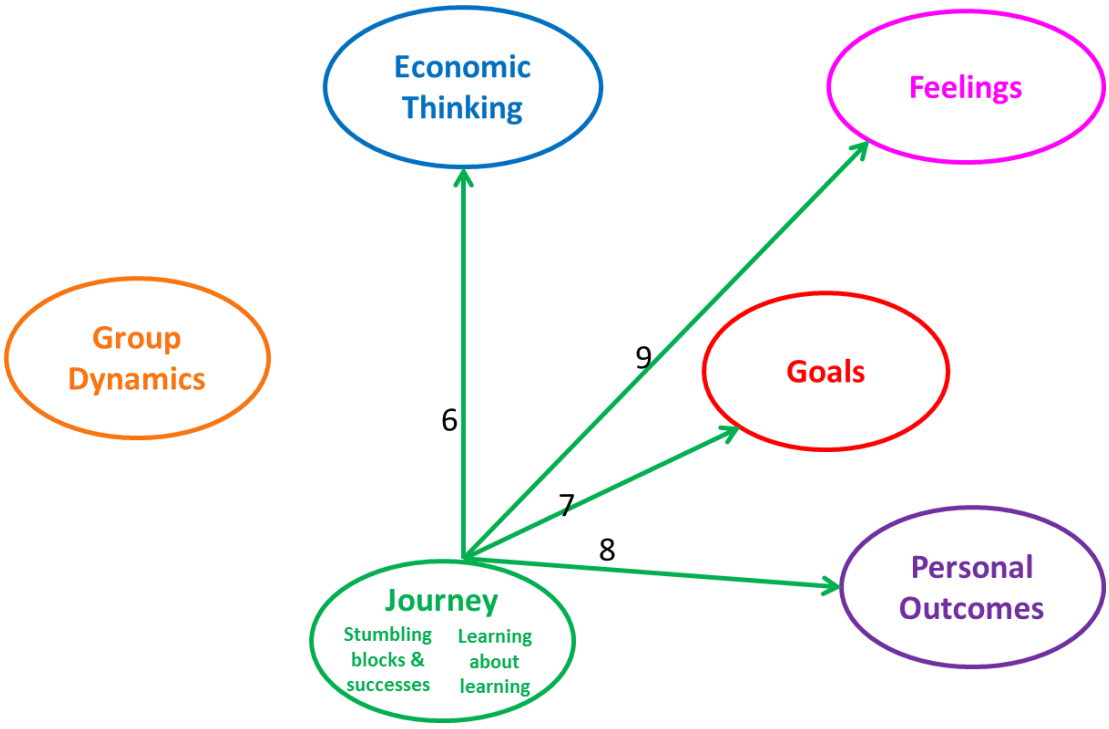

Figure 10. Influences of the Learning Journey

7.2.2.1 The Learning Journey influences Economic Thinking

In line with their casting of learning as a journey, students construed Economic Thinking as the destination reached through conceptual discovery and mastery.

> *Thinking like an economist is definitely one of the successes of the Journey. Perhaps it can be said of it, that it is the destination of the Journey. When the hard-work finally pays off! The journey through learning and understanding concepts of economics would shape my Economic Thinking. Discovering how to use the language of economics using daily experiences. I have tried so hard throughout this year and during my first year to understand economics. The more I struggled with a concept, the more I was forced to try and understand it. Going through the modules forces you to think like one – like when I had to hold things constant and look at two changes only. As time went by, studying economics and broadening my knowledge, I started thinking more like an economist.*

Developing Economic Thinking was the desired and logical outcome of the Learning Journey. Mastery of disciplinary concepts, language and techniques — often after great personal effort and perseverance — brought about a new way of thinking.

7.2.2.2 The Learning Journey influences Goals

The Learning Journey helped students to approach more immediate goals, and (for some) to clarify longer-term goals.

> *When I understand some concept, I got closer to achieving my goals. Discovering new learning styles, stopping the procrastinating helps achieve goals. The journey through understanding economic concepts and learning of my capabilities caused the creation of goals with future aspirations. My journey in economics made me think differently about my goals (I definitely want to be an economist). I wasn't sure at first but now I have no doubts. The journey for me was interesting and it kept inspiring me so it also helped determine my goals, 'cause now I know I'd like to pursue eco's, not just pass it.*

Progress in conceptual learning and metacognitive consciousness brought students closer to attaining their academic goals. Some students' positive experiences of learning economics prompted them to set longer term goals around further study or even careers in the discipline.

7.2.2.3 The Learning Journey influences Personal Outcomes

Positive Personal Outcomes were generated through the processes of conceptual mastery and improving metacognitive and interpersonal skills that comprised the Learning Journey.

> *Along the journey, we learned and interacted not only about economics but ourselves, the Journey impacted us personally, individually. My journey in the tuts was difficult at first but through this, I've seen myself being another person. During the journey I learned to use economics in my life and I view that as a personal outcome. Learning to understand and not memorize opened up my general knowledge and enlightened my way. The more you worked on your stumbling blocks the more confident about what you know you became. Because the journey was smoother for me, my personal outcomes [were that] I became more confident and I developed as a person, I became motivated, and my self-esteem grew.*

The Learning Journey gave students a different view of learning (through understanding), provided a way of thinking they could apply in decision-making in their own lives, enhanced their confidence, self-esteem and motivation, and contributed to a changed view of themselves.

7.2.2.4 The Learning Journey influences Feelings

Elements of the Learning Journey directly affected students' emotions, both positive and negative.

> *The journey throughout saw various changes in our feelings about it, and about ourselves. From anxiety to excitement to confidence and enlightenment. My being stuck on some concepts made me feel sad and disappointed. The more I struggled the more anxious and frustrated I felt. Challenges and successes influenced the way we felt about certain concepts. When I stopped memorizing and started understanding I became excited. Transitioning from a point of confusion to a point of understanding of economic concepts brought feelings of accomplishment. I feel good on how far I've come and the challenges I have overcome. I have had fun, never thought economics could be fun but it turned out to be and I loved it.*

The Learning Journey caused strong and shifting emotions. Anxiety, frustration, sadness and disappointment marked periods of stuckness. On the other hand, becoming aware of their own progress brought students excitement, confidence, a sense of accomplishment, and enjoyment.

7.2.2.5 Synopsis: Influences of the Learning Journey

The conceptual and metacognitive tracks of the Learning Journey influenced all of the other affinities bar Group Dynamics. Economic Thinking was seen by participants as the destination of their Learning Journey, the reaching of which often required effort and endurance. The progress in their conceptual learning and metacognitive consciousness brought participants closer to their immediate academic Goals, and prompted some to form longer term aspirations towards further study or a career in economics. Positive Personal Outcomes of their progress subsisted in their changed views of learning, a new disciplinary perspective they could apply in their own lives, and enhanced confidence, motivation and self-concept. The Learning Journey was an

emotional one, in which participants' progress (or sometimes the perceived lack thereof) was marked by strong and shifting positive and negative Feelings.

The next section elaborates the elements and influences of the other, closely related secondary driver of participants' learning: Economic Thinking.

7.3 Economic Thinking

Through their studies, students gained Economic Thinking: a distinct disciplinary perspective they could use to analyze real-world events. Several sub-affinities captured the meanings students ascribed to Economic Thinking:

- bringing the logic of economics to bear on decision-making in their own lives;
- acquiring a distinct disciplinary perspective on real-world events;
- learning analytical skills which bring personal empowerment;
- the disciplinary language of economics, and its ties to conceptual understanding;
- 'hardwiring' the economic way of thinking.

7.3.1 Elements of Economic Thinking

7.3.1.1 The logic behind every decision that one takes

Individual understandings of Economic Thinking converged on *bringing the logic of economics to bear on the reality of decision-making* in their own lives.

> *If I think of economic thinking the thing that just rushes through my mind is the logic behind every decision that one takes, whether it's in the store purchasing, whether it's cooking whatever dish you're preparing over another, and even in relationships – that, surprisingly! So economic thinking is for me a way of actually guiding you to a certain decision – I mean it's kind of the logic behind taking a certain*

decision with one's life and whatever a person is going through at the time. So using choice theory and marginal analysis and all the other stuff. Whatever you do, decisions I try to make - you have to see the marginal cost and the benefit, so you see already you're thinking like an economist! I've been using a lot of trading off, if that makes sense – you think ok, now you're giving up this for this, and it's all coming to be economics. It's when I try to relate the real situation that I have been in with what we have learnt - like be able to apply what we have learnt, not just to a situation that we are mostly told about in textbooks say, but be able to apply the economic concepts in our daily lives. You take the concepts and you put them in a broader aspect – you don't study because you have to study, you can also use it in your life, you can use economic concepts in real life. It seems as if somehow economics is a part of everything that we do in life, I've been seeing it.

Participants noted the relevance and usefulness of economic ideas such as comparing marginal costs and benefits, opportunity cost, and incentives in their own daily lives. These were not merely academic concepts to be studied; economic concepts could be seen in any real-world situation. In referring to themselves and providing everyday examples, participants conveyed a personal appropriation of economic logic — a decision-making guide they had come to own and could usefully apply in their immediate contexts.

7.3.1.2 You don't just see what everyone else is seeing

Developing Economic Thinking means acquiring a *distinct disciplinary perspective*, which enables one to interpret and explain events with insights that would not be available to people without knowledge of economics.

This is something that opened my mind - the way I'm thinking now is different from last year… and you can apply in your daily life, you

can think like an economics student. The concepts that were applied… are concepts that only an economic person should know, not anyone from the streets. The concept of considering the opportunity cost and marginal benefits in everyday life as an economics student is important, and without fully understanding these concepts your mind will be running around in circles just like the mind of a person not studying economics… These concepts are the basis of understanding economic decisions. An economist has to be more logical than subjective about the choices and behaviours that they try to examine. You don't just see what everyone else is seeing, you see a bigger picture. And that's what I like, that's what I like…

Participants noted that their way of thinking had changed as a result of learning economic concepts. This economic understanding gave structure and direction to their thoughts, and illuminated their view of the world so that they saw a bigger picture, reached a logical and objective interpretation of behaviour, and developed an accurate understanding of current events. Participants felt that gaining these insights also somehow distinguished them — as economics students or economists — from "*everyone else*".

7.3.1.3 A tool that would help me understand the world

The way in which the disciplinary perspective and its associated *analytical skills serve as tools* to understand real-world events brings a sense of *personal empowerment.*

The world can be confusing, but at the same time I think people always think that it's rather simple, so I feel more confident knowing what's going on around me than being clueless about it, 'cause [then] I'd feel like I'm missing out on something. So I use economics to try and understand the world, and then use that understanding to benefit me... and just be able to be more informed, rather than just accepting, taking everything from other people as it is. I'm not the kind of person

> *who takes things as they are, because I like to have at least some understanding of what is happening in order for me to be successful in what I am doing. It's a great asset which is from the beginning why I decided to do economics actually - because I needed a tool that would help me understand the world and how it works and how people make decisions. It's just a certain way of doing things, there are rules that you have to follow, it's this – this - this. Economics is at your disposal in a way.*

Participants felt that having mastered disciplinary concepts and skills enabled them to arrive at their own interpretations and informed opinions about real-world events; they could decide about issues for themselves rather than accepting the opinions of others. The disciplinary understanding was a tool or an asset that equipped and empowered them.

7.3.1.4 I'm using economic language

Students recognized that the *disciplinary language of economics* is distinct from everyday language and inseparable from conceptual understanding; language could be both a source of trouble and a mark of learning.

> *But then why is common sense confusing me so much? Like their common sense and my common sense. It's probably the same but when they change names that's when it kind of gives it a different meaning all of a sudden. I'm not thinking about it in economic terms. I'm thinking of it in my normal understanding. There is economics behind it, but I just didn't know it. So maybe, you know, it's there but the words… I don't use those words. I'm repeating this module and I kind of realized when I started attending the group, the language is actually different, like for example opportunity cost and explicit cost and all that stuff – it's not – I interpreted it in the wrong way, so when I got to essay writing questions I always did badly, 'cause I'd write*

> *my language, and I realized it wasn't the correct way of writing things. The way I learnt, I kind of figured that I should start learning the language, instead of trying to get it in my words and understand it…*

Economic terminology is a potential source of difficulty. Students may be confused by the disciplinary labels assigned to concepts of which they already have an intuitive, commonsense understanding, and may feel alienated from their understanding by the unfamiliar words. Realizing that the discourse of economics is distinct from everyday language may be experienced as a breakthrough in itself, as students perceive that they need to master the conceptual terminology rather than trying to translate or simplify ideas down to everyday language.

This difficulty might be compounded if English is an additional language and not a student's mother tongue:

> *My ability of analyzing in my second language… sometimes [it] can be difficult to really understand, at times you need to read twice to get to understand other things. Some of the big words used in economics, I would need to google first to understand them. The only problem I have is to express myself or to explain exactly what I learnt in English. I speak French and Swahili so sometimes English gets very difficult... I learnt something with the group in the sense that, even if English sound badly or difficult the way I explain something, I just need to spell it out so I get corrected and learn new things (new vocabulary, ideas).*

Despite the additional layer of translation required, expressing one's economic understanding in English was recognized as an essential part of their learning.

Some participants observed (often with surprise or pleasure) that they had begun using economic language outside of class:

> *And there are times when I even use economic terms and I'm like, oh ok, whoa – I get a shock, it's like wow, I'm really understanding the module a whole lot better. I am now also using a lot of economic vocabulary in my everyday life which my friends find hilarious but it helps understanding. I realize that… this terminology is flexible, so I can say that I've learnt to apply it in reality and it's actually fun! Especially when you apply them with people who understand what you're talking about. Lots of people you have to explain yourself to, and you find that in the end they don't understand what you just said.*

Using economic terms in informal settings could be seen as a signal of their having internalized economic thinking, and having attained common disciplinary understanding with fellow group members. The suggestion that the use of economic language might convey a sense of becoming disciplinary insiders resonated with my observation (noted in my reflective journal) after the focus group sessions that many students had "used economic language / techniques (graphs, equations) in their responses — humorously, and accurately" (12/11/2014).

7.3.1.5 It's just in me now

Once mastered, the *economic way of thinking became internalized* or 'hardwired' as a cognitive technique that many students saw as part of themselves and would deploy as a matter of course.

> *At the beginning, economics was just a course for me. And then with learning it I started to think about it and start to think like one, you know, like every aspect of life, trying to think like an economist. That's what it's actually doing for me now. A long time ago it was just a course, I was majoring in it, I liked it, but I wasn't applying it so much. So I thought maybe I will learn a little more in 3rd year or something, let me just study it. It wasn't really really me - but then*

> *now it's starting to grow, it's becoming a part of me, and I'm starting to like it even more, because now I can see I can do it, and you know it's just in me now. Sometimes, these things, you get used to them in such a way that they become part of everyday life. I remember [in the focus group] one of us wrote 'thinking like an economist' - the things we got to learn, how to apply economic terms in life in general - and I've become one of those people.*

Over time, seeing the world through an economic gaze became increasingly automatic. Participants described feeling that the disciplinary perspective had become internal to them, a part of the meaning frame through which they made sense of reality, as they became more adept at applying economic analysis. Their sense of self shifted as they internalized this understanding and became "*one of those people*" who can "*think like an economist*".

7.3.1.6 Synopsis: Elements of Economic Thinking

Economic Thinking denoted the distinct disciplinary perspective that could be a powerful tool for analyzing real-world events, whether on a personal or global scale. Individual meanings for this affinity converged on students' increasing application of the logic of economics in their own lives. The disciplinary language of economics is a critical part of Economic Thinking: different from everyday language, its use was both a source of difficulty and an indicator of disciplinary understanding. Once fully grasped, the economic way of thinking became 'hardwired' and students found themselves applying it unconsciously.

7.3.2 Influences of Economic Thinking

Economic Thinking was another secondary driver in the system, and directly influenced participants' Goals, Personal Outcomes and Feelings (as shown in Figure 11).

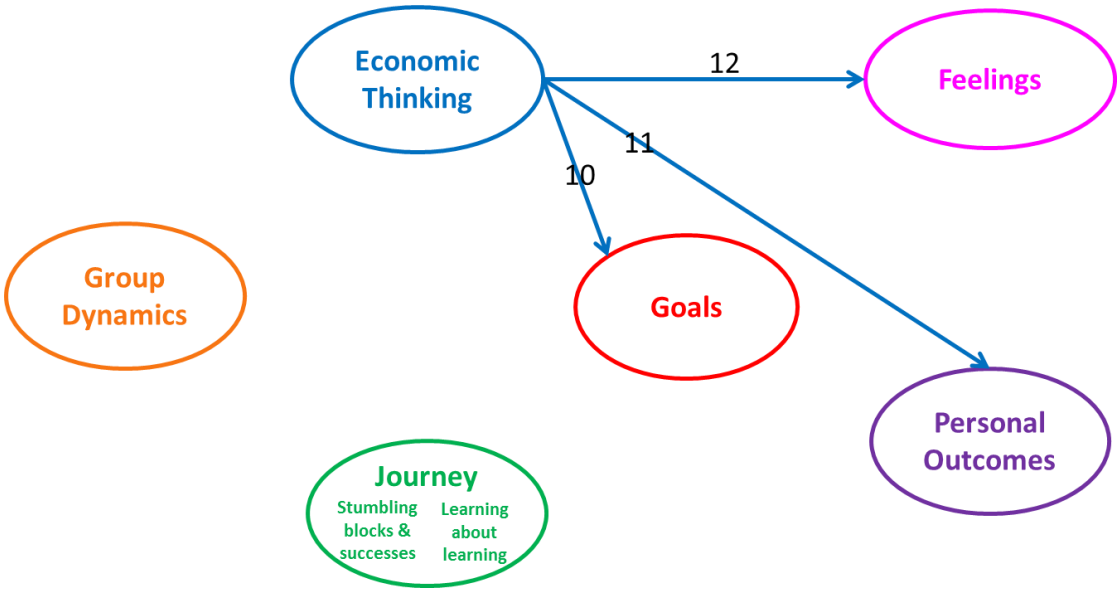

Figure 11. Influences of Economic Thinking

7.3.2.1 Economic Thinking influences Goals

Economic Thinking influences Goals through two main channels. First, economic logic could be applied as a cognitive and philosophical tool in one's own goal-setting:

> *I've changed my goals because of economic thinking. Economic thinking has influenced the way I want to achieve, and rethink some of my goals, probably in favour of the goals that are going to maximize my happiness and that of those around me. Thinking like an economist helped me refine my goals, it gave me an economic perspective of the future. Economic thinking acts as a catalyst to me and having and pursuing goals. How to maximize my time, how to maximize my utility of studying in a certain time period when I am studying.*

Once internalised, the disciplinary perspective on decision-making caused some students to revise their life or study goals.

In a different process, mastering economic concepts meant that the goal of improved understanding had been reached; here, Economic Thinking was not so much a philosophical tool as a skill to master and perhaps pursue:

> *My goal was to learn how to understand and explain economics. The more I thought like an economist using economic concepts, the closer I got to my goal. When I get concepts and understand economics, I just want to do Honours in economics! Thinking like an economist made me aspire to becoming an economist. With the economic thinking, understanding a few concepts, they kind of give me ammunition to focus on how I can use that attained knowledge and that logical thinking… I know I'm going into the world with enough knowledge and ammunition to now challenge real-world related problems. So with economic thinking, that's my key into getting into that world. So with that I can reach my goals.*

Attaining a mastery of the relevant concepts was a goal in itself, but also sparked some participants' enthusiasm for further study and perhaps a career in the discipline. Echoing earlier descriptions of the empowering effect of gaining this knowledge, Economic Thinking could be "*ammunition*" or a "*key*" for engaging with problems in the working world.

7.3.2.2 Economic Thinking influences Personal Outcomes

Economic Thinking brought new perspectives on the world, personal insights, and greater confidence.

> *Economic thinking was my greatest outcome. Economic thinking would open my eyes to how the world works and as a result a new confidence in my education was created. Thinking and talking economics helped me. Economic thinking has influenced my personal growth as an individual. I make more informed decisions now than*

> *before. Economic thinking makes me think about our personal decisions in a more economic (maximizing) way. I have learnt how to think like an economist which has developed my academic growth and growth as a person. When I'm applying some concepts now I'm able to just apply them with confidence knowing that exactly, I know what I'm saying and there's no one that can just come and be against what I'm saying. I know what I'm saying.*

In reflecting on how Personal Outcomes arose from their having developed an economic perspective, participants described changes in their own ways of viewing and engaging with the world. Disciplinary insights on reality opened up their worldviews, and becoming competent in using economic concepts increased their self-confidence as they became sure of their knowledge and opinions.

7.3.2.3 Economic Thinking influences Feelings

Economic Thinking produced both positive and negative feelings. Feelings of happiness or excitement were linked with participants' awareness of their own progress in mastering the way of thinking:

> *Before I thought like an economist I hated my first test because it was confusing; but then things turned around and I was excited. I feel happy when I understand my substitution [effect], income [effect] graph. To think like an economist makes me feel happy. Thinking like an economist makes you feel like an economist and feeling like an economist feels great.*

Mastering content brings the satisfaction or joy of accomplishment. When seen in juxtaposition with the feelings of anxiety, frustration and depression that mark periods of stuckness, this may include a strong sense of relief as things "*turn around*" and students realise that they have progressed in disciplinary ways of thinking. This in turn

has positive impacts on self-esteem, and for some students, on their sense of self with regard to the discipline.

At the same time, some expressed a sense of sadness or loss linked to the new way of thinking, specifically tied to the idea of opportunity cost:

> *Economic thinking affected me to the extent that by economic thinking I as an individual should maximize my gains, which I felt differently about in the past: now I feel I must, if not I am sad. The issue of scarcity and trade-offs, opportunity costs hinders us from maximizing our happiness; and more is better, it is sad how one has to choose. Opportunity cost: it's irritating how opportunity cost affects every decision I make. Thinking about what all my opportunity costs are made me sad, realising what was being given up.*

This mild feeling of sadness (or irritation for one participant) had little to do with their own performance, and could be characterized as an existential sadness arising from the disciplinary view of reality: reaching the understanding that any choice they made in life would require them to give something up.

A few students expressed possible tensions between Economic Thinking and Feelings that centred on their values. Some felt that the principle of self-interest underpinning the economic approach to decision-making might *clash with their personal values*:

> *Before economics – the part about maximizing my happiness or utility – well, I have to say that in a way it does seem as though if you're maximizing your personal happiness or utility, you're selfish. So before learning it, I didn't do things selfishly. Whatever maximizes the utility of the majority, I used to say that. It's not about personal gains. I can't think like that, my feelings get in the way… You can't walk around thinking 'I want to maximize my benefits, I don't care what happens to someone else!' You can't do that as a person, it's not really doable. You consider other people most of the time.*

Narrowly defined self-interest or utility maximization could be dissonant with students' feelings of altruism if interpreted as a code to live by.

7.3.2.4 Synopsis: Influences of Economic Thinking

Participants saw Economic Thinking as a tool to help them set study or longer term Goals, as well as a skill to master that would equip them with the means to achieve their Goals. Acquiring a disciplinary perspective led to Personal Outcomes in the form of changed worldviews, personal insights and increased self-confidence to express their understanding and opinions. Developing Economic Thinking evoked a range of Feelings for participants. As well as the relief, joy and satisfaction derived from becoming aware of their own progress in the discipline, some students also described feelings of sadness, arising in particular from the deeper implications of internalizing the idea of opportunity cost. Others felt a discomfort that could be summed up as moral dissonance, associated with adopting a way of viewing the world that might conflict with their own altruistic values.

7.4 Concluding comments

The findings from this chapter portray learning as a transition that leads to changed views. The Learning Journey has Economic Thinking as its immediate destination, but has multiple dimensions. It entails not only grasping disciplinary concepts, but also acquiring new language with which to express that understanding, and can bring new views of the world and oneself. The conceptual shifts required to advance in disciplinary learning need to be enabled by a level of metacognitive consciousness. For most participants, this involved a shift in their conceptions of what learning is and how it may be achieved. This may be summed up as the constructed understanding of meaningful knowledge.

Discomfort, uncertainty and stuckness are part of the learning process, and can evoke strong emotional responses that are not accounted for in traditional lectured delivery. Students may languish alone in stuckness until they withdraw (literally or emotionally)

from their studies if they do not have the metacognitive and affective resources required to stay the course. In the tutorial programme, aspects of the groups helped to foster the growth of this metacognitive consciousness, as well as providing affective and cognitive support, as described in Chapter 6.

Findings point to significant gaps in many students' understanding of disciplinary principles and concepts they could have been expected to master in their first year of study. This raises questions about the curriculum and pedagogy of level 1 economics, and about the way in which it is assessed, as well as the disciplinary knowledge and skills base that level 2 teachers may assume their students have. A similar point arises from their reflections on performance in level 2 tests, and the possible disjuncture between teaching and assessment. More broadly, students' reflections on their *Learning about Learning* suggests that there is wide variation in their metacognitive skills and abilities to manage their own learning effectively. Rather than assuming that as students in (at least) their second year of tertiary study they are all acclimatized to its demands, consideration could be given to how these abilities might be fostered. In short, participants' reflections suggest that there are aspects of the requirements of disciplinary learning — both conceptual and metacognitive — that are not being made explicit enough.

The journey to disciplinary mastery also demands conscious effort, motivation and a sense of self-efficacy. Progress in learning takes will and direction; it can be coloured by strong feelings, and it brings self-relevant outcomes. These aspects are described in Chapter 8, which considers the outcome affinities: Goals, Personal Outcomes and Feelings. Thereafter, Chapter 9 will discuss the findings from all three data chapters.

CHAPTER 8
INDIVIDUAL REALITIES: GOALS, PERSONAL OUTCOMES, FEELINGS

8.1 Introduction

This is the third and final data chapter, which adds descriptive detail to the outcome affinities — Goals, Personal Outcomes and Feelings — and their relationships of influence. Despite being relative outcomes in the broader system of students' learning of economics portrayed by the SID, these affinities together can be viewed as constituting a self-reinforcing sub-system, which in turn feeds back to influence the other affinities. In Chapter 5, this sub-system was termed the Heart loop because of its emphasis on motivation, personal growth and emotional aspects of learning.

Following the same structure as the previous two chapters, sections 8.2–8.4 consider each of these three affinities in turn, describing first their constituent sub-affinities or elements and then their influences on other affinities. Section 8.5 offers some participants' individual understandings of the interconnections between affinities in their own learning of economics through the programme, which align broadly with the interdependent, circular and self-reinforcing relationships suggested graphically by the SID. Concluding comments are made in section 8.6. Findings from participants' descriptions of these three affinities, as well as those described in the previous two chapters, will be discussed in Chapter 9, in relation to existing literature and the threshold concepts view of learning that frames this study.

8.2 Goals

The meanings participants ascribed to this affinity varied, both in the extent to which students had consciously formed goals and in the scope of the goals they articulated. The following categories of meaning emerged from my analysis of the students' descriptions of the Goals affinity:

- narrowly interpreted performance orientation, centred on passing the module;

- an intrinsic desire for understanding of economic phenomena;
- forming conscious, long-term intentions regarding study or career aspirations;
- crystallizing economics study and career plans.

These are described in turn in the following sub-section.

8.2.1 Elements of Goals

8.2.1.1 Just to pass

Some students described this affinity in *narrow, performance-oriented terms*, identifying their goal as being to pass Econ 202.

> *My overall goal is just to pass, 'cause I'm not looking to doing it again. Right now my goal is just to get my degree and then I guess take it from there. At the moment I finish my degree end of next year, and I need to pass Economics 202. I think [my goal] would be me passing economics, getting over it that way. And for the exams I'll calculate my class mark and I'll say ok, at the exam I should work this hard. So the goals – it goes back to the economic thinking, like trade-offs, opportunity cost - for me to achieve I have to give up my leisure time, see? The reason why I joined this group was because I don't like economics and I don't understand it and I failed [Econ] 201, so I thought if I do this, I'd come out with like a secret formula, so I just put a + b = me passing! I think most students think economics is an elective, they take it to second year and then they think they're going to leave it. It's just part of B.Com. requirements so they just want to get it over and done with. So they don't see the value of doing economics. So there's a clash of opinions there about what's important…*

This quote includes the voices of four participants who seemed to perceive the module merely as a requirement — or even an obstacle to be overcome — for degree completion, rather than as having inherent value or interest. Students who do not find economics enjoyable may take a calculated approach to passing, aiming at applying the minimum amount of effort (or hoping for a "*secret formula*") which would lead to a pass. Students expressing these views were predominantly non-majors — BCom or BCOA students for whom Econ 202 was a compulsory module.

8.2.1.2 I just wanted to understand more

Other students pointed to an *intrinsic desire for understanding* of economic phenomena as an important element of their goals.

> *I think at the beginning, when I signed up for this, my main goal was to understand. So I was open-minded when I went into it, like anything that helps me understand what I'm doing will be a plus. I'm not majoring in economics, just trying to understand it better - that's the main thing at the moment for me. I have developed an interest in economics, why people behave the way they do… I want to deepen my understanding, to know more about it. Because it was a subject I usually liked to hear about from my friends, 'cause I did physics in high school. So when I got a chance to do economics, it now started to be part of my goals that I want to [go] further on it, I don't just want to hear about it from other people, 'cause it seems like quite an interesting module to understand because it's like – it lives around us, we get to apply it in most of the situations that are happening. When I started economics, there were some things that I just wanted to understand more, rather than just being told like in the paper, this has happened.*

A desire for deeper understanding could relate to both immediate goals (signing up for the tutorial programme to understand course content better) and longer term goals

(pursuing further study in economics). Participants who emphasized understanding also noted that they found economics interesting in itself, and included some non-majors as well as students who planned to major in the subject. Seeking understanding for its own sake motivated them to approach learning with an open and positive attitude. It implied a view of economics as relevant, valuable knowledge that would help them make sense of the world.

8.2.1.3 Knowing where I want to go

Other interpretations of the Goals affinity encompassed *conscious, long-term intentions,* whether fully formed or emergent, from postgraduate study plans to career aspirations, which had a bearing on students' decisions to study economics.

> *Goals - like what you want to achieve, what you want to do, so it's basically about your own individual assessment of yourself. And where you're going in life, in your studies and everything else. I'm not sure if I should major in economics, because it's a bit hard. So I'm just going to check my marks and then decide. I'm doing Politics, Government, Business and Ethics – not a B.Com.. I'm thinking of carrying on at this point for Honours or even Masters so… I'm interested in African development, I'm also interested in working overseas, in multinational companies. That's why I took economics. So those are my goals for economics, looking at the future basically. I just think economics is a very crucial thing to have as a tool, to like have in your background just generally in what I want to do, because I'm looking at going into diplomacy so I think it would be good to have… I wasn't sure what I wanted to do after my studies… but at heart I know that I want to be an academic, I want to teach someday… [but] I have people who are depending on me at home, so I think I have to work first for a couple of years and then come back to finish my studies and take the academic route.*

Students alluded to goals as long-term intentions or plans that played a role in structuring their study choices. Regardless of whether they had decided to continue with economics, they related their studies in the discipline to the long-term views they took of their careers. They spoke about goals in terms of their future selves, and felt that studying economics was valuable in that it could contribute to those goals.

8.2.1.4 This is the thing that I want to do

Among those who had chosen to continue with economics to third year or beyond, several described the evolution of their goals over the semester as their *study and career plans solidified.*

I wanted to do economics, that's true, but … now it's fixed, I know that I really want to continue like that. So I had other goals, 'cause I was thinking of maybe finance or something, but then during this tut group I've learnt that this is the thing that I want to do. Ja, it's helped me to be fixed and decide… I've also been talking to my parents about it and… I've told them it's fixed now, I'm not going to change any more what I want to do. So they said, OK then good, if you like it, it's fine. When I came to varsity I didn't know what my career was… it started by being blurry, now the picture's becoming more clearer and clearer, just because I went to the tuts. At first I applied for accounting – because in high school I didn't know any other courses in commerce. And when I got there, in the middle of the first semester I wanted out; so then I finally decided, you know what, I'm going to go for eco's and finance. And I think I like the stream that I chose for myself, I think I like the fact I chose economics. At the beginning of the tuts, the group, I was ok, I want to be an economist - I would say that and not really mean it; but now it's clear what I want, personally what I want, and even though I may not know how to get there, it's not like I'm trying to convince other people that I want to do economics, now I really want to.

Participants (at least four from the group, whose voices are captured in the quote) noted that their experiences in the tutorial group had helped them to make or confirm the decision to major in economics, or to consider further study or a career in the discipline. Gaining insights into their interests and aptitudes brought greater conviction regarding their study and career intentions, enabling them to make such decisions by and for themselves. For these participants, reaching the decision that economics would be part of their future study and/or career plans was associated with a newfound firmness and clarity in their sense of themselves.

The sense that many had started out on their studies without having fully thought through their long-term goals is echoed in reflections I wrote soon after the interviews: "It's remarkable how many of them had changed course during their studies, some repeatedly — six out of 20, because they didn't like accounting, or other plans 'went wrong' — no obvious pattern. Five of the six now plan to major in econ" (4/11/2014).

8.2.1.5 Synopsis: Elements of Goals

The Goals affinity carried a range of meanings for the participants. Some tended to define Goals narrowly as a hoped-for pass in Econ 202, which would enable them to proceed with their degrees. Conversely, other students (both majors and non-majors) described their Goals as stemming from an intrinsic desire for deeper understanding of economic phenomena. Some students felt they had had economics imposed on them (mainly BCom and BCOA students not majoring in economics, for whom the Econ 202 module would be terminal and compulsory), while others saw themselves as having chosen to study economics (BCom students majoring in economics, and those doing other degrees who were taking the subject by choice). Students who felt that they had chosen economics described a broad range of considered, longer term plans and aspirations relating to their choice, some of which had evolved and crystallized over the course of the semester programme.

8.2.2 Influences of Goals

The Goals affinity influences the Learning Journey and Personal Outcomes (as shown in Figure 12).

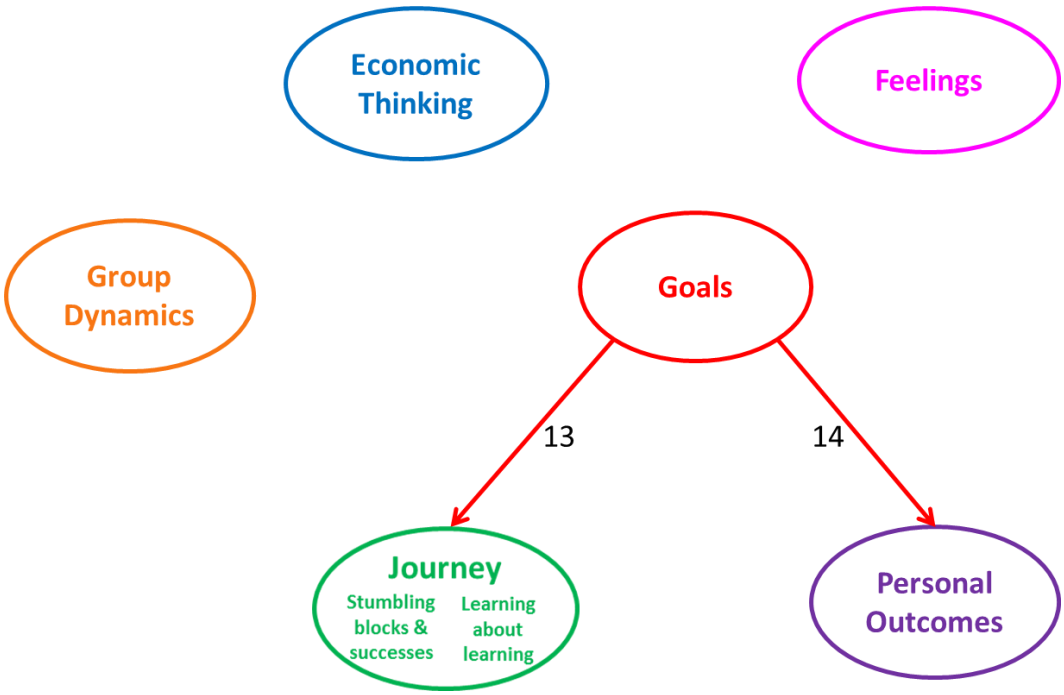

Figure 12. Influences of Goals

8.2.2.1 Goals influences the Learning Journey

Goals — whether performance-specific, career-related or more generally directed at greater understanding — served to direct the participants' Learning Journey.

> *My goals drive my journey. They drive the path I want to take in learning economics, how I tackle challenges and move on in my journey. If you know how important econ is to your career and degree, one really tends to pay more attention to it. The plans I had set out determined the journey I would take. I want to achieve excellent marks in economics and I would not drop it because it is a major. My goal for becoming an economist has made the stumbling*

> *blocks in the way become stepping stones that improved my understanding. [My] goals have helped me to carry on [with] eco's because there is a lot of new stuff to learn and grasp. It has helped me to not easily give up on some aspects of economics because it could be a difficult module that is very challenging, so me having interest has given me that motivation to pursue it even if it is giving me a hard time. I also came in with a motivation, positive attitude and determination to pass economics since the career counsellor advised me to think carefully about majoring in it as a lot of humanities students who take economics find it difficult and fail; I am not getting the marks I think I deserve right now but I have been able to pass all the economics modules I have done. Setting goals to defeat our weaknesses.*

Participants found that conscious commitment to particular goals — such as achieving excellent marks, completing a major or embarking on a career in economics — set the course of and fuelled their Learning Journey, and provided the motivation to persevere in the face of challenges.

8.2.2.2 Goals influences Personal Outcomes

The motivation and direction afforded by having clear goals favoured the emergence of positive Personal Outcomes.

> *The goals I have helped to improve my personal outcomes, because the enthusiasm and aim help to improve my outcomes. My goals drove me to learn more which has developed me and my knowledge. One of my goals was to [increase] my knowledge, and that made my personal outcomes out of it more on the positive side. Reaching goals gives you personal achievement. Goals created from learning outcomes would create personal outcomes of calm about [an] unknown future, [for*

example in terms of] career. Goal setting, in my view, is a personal outcome.

Having goals enabled participants to focus and align their efforts for academic and personal development. Attaining their goals brought a sense of achievement, and of greater certainty regarding their future plans. In this sense, setting goals could in itself be seen as a personal outcome for participants.

8.2.2.3 Synopsis: Influences of Goals

Clearly articulated, well thought-out Goals could provide direction and impetus for students' Learning Journeys, guiding their study choices and sustaining their motivation in the face of challenges. Similarly, clear Goals facilitated the attainment of positive Personal Outcomes in terms of participants' academic, social and self-development, because they were a source of motivation. For some students, clarifying goals might be a personal outcome in itself by virtue of the greater sense of certainty created around their future plans. However, not all participants expressed their understanding of the Goals affinity as reflective, long-term intentions. Some had little to say about their Goals, while others interpreted Goals in narrow, performance-based terms. The positive influences just described depend on students' having broader, considered, long-term conceptions of their goals in relation to their learning of economics — a point which re-emerges in the discussion of the elements of Personal Outcomes in the following section.

8.3 Personal Outcomes

Personal Outcomes embodied a range of benefits that students ascribed to their learning on the tutorial programme. The sub-affinities that emerged from my analysis of interviews and reflective writing were:

- academic benefits, from immediate, course-related impacts to broader metacognitive outcomes;

- developing interpersonal skills;
- increased self-confidence around disciplinary knowledge and verbal expression;
- growing social resources — the friendships and networks established in the group;
- a sense of personal transformation linked to emergent disciplinary mastery.

8.3.1 Elements of Personal Outcomes

8.3.1.1 I developed in my academic world

Students recounted a range of *academic benefits* they considered Personal Outcomes of their learning, from immediate, course-related impacts to broader metalearning outcomes that they could transfer to other courses and contexts.

A personal something for me – this is the first time that I've passed all three tests for economics… It's confidence, and I think I'll be better prepared come the exam. I have grown studying. I've developed. 'Cause I've learnt a lot - I've learnt things that I didn't know before, and I know what to do now next time, in terms of studying and the things that I've learnt. It helped me in that sense that I developed in my academic world. I think that my mind is more open, not just in class, and not just in the module that I'm studying, but in all the other modules. Because I've learnt that ok, I need to understand the concepts of things or the way things move, and not just be cramming and you know putting things in my mind – but to really get an understanding. Because understanding the basics, I think when I further on I'll be able to cope with more. Maybe you can't see it now, maybe I can't express it – but for me it's just a good thing, it's something that I can talk about, I always talk about it, so now I know what to do. It helped me how to study, not only economics but other

courses too. So from this point I can understand something, learn how to study, how to understand and how to express it.

Participants expressed a sense of empowerment and increased self-efficacy stemming from the way in which they had learnt. They felt that they could help themselves to reach understanding, and had grown academically as a result of insights they had gained into their own learning — notably the importance of understanding and application rather than "*cramming*", and the potential of talking to reach understanding. They recognized that the insights and approaches to studying they had discovered were transferable, and enabled them to "*know what to do*" in future, in this course and others, which boosted their academic confidence.

8.3.1.2 Learning to interact better with people

Students felt that the group interaction in the tutorials helped them to develop their *interpersonal skills and self-awareness*, bringing benefits beyond the module.

I'm normally very quiet – I'm too reserved. I normally keep my thoughts and feelings to myself. But in the tuts I got to share them and I discovered the other side, that I can interact easily with people and can think out of the box. In the tut I became more comfortable and more outspoken. I learned to listen to other people. I realized I actually don't listen… there's something that's just in my mind that's no, do your own thing… but in the group it was a great thing to listen to other people and give them their space, 'cause they know what they're talking about. That doesn't only help in like a learning environment, but just in life in general - you have to listen to other people, there's no other way! Yeah, I think I've grown a lot. Communication was one of my weak points, like I couldn't start to open up with a group. So I think that was one of the hardest things I had to do, even though I was like a talkative person. And being in the groups and talking to different people and realizing hey, I can talk to

people, and they find me interesting, and I find them very interesting, and it was really, really nice, it was awesome, it was great. I got to understand myself and how I work in a group.

Many participants who described themselves as reserved found that the groups provided an opportunity to engage with others and express themselves more freely than they would usually. For more outspoken participants, the group setting developed their listening skills and appreciation of others' insights. The group interaction provided personal affirmation and increased self-knowledge.

8.3.1.3 I feel confident

The development of both students' academic and interpersonal skills (the previous two sub-affinities) led *to increased self-confidence* around their disciplinary knowledge and verbal expression.

You feel more confident, you get used to people so you're more confident in your work, in the group exercises, more confident to share your ideas. Although I didn't participate much in the tuts, I think now my confidence has been boosted through the interaction with the other guys. So you realize that ok, I'm actually growing and interacting with more people and I'm no longer afraid to really expose more of the way I think and how I am. I can now talk to people. I can express myself now. So I feel confident to talk, I feel confident to express myself and learn other things. Ja, it's like something has just opened everything, opened my mind. I can talk about economics on any other courses with confidence.

Participants spoke simultaneously of social, disciplinary and personal aspects: heightened confidence was manifested in their social interactions, in their willingness to

expose their thinking and express opinions, and in their self-belief, within and beyond the tutorial group.

8.3.1.4 I built relationships with other people

Growing *social resources* — the friendships and networks that students also referred to as a key element of Group Dynamics — constituted an important Personal Outcome of their learning on the programme.

> *I got to know everyone. At the end I was looking forward to going to the tuts every week. 'Cause I'd always had a really small circle of friends... So I actually know people in my economics class now besides Cee! Because for the past year and a half Cee was the only person I knew in all my classes. I built relationships with other people, so now I know who to ask if I don't understand something. Whenever I didn't understand stuff I just had to go to my friends, I could actually go and approach Smiso or Joe or Lihle or anyone else. It tended to kind of like push the boundary - I started to trust some people with certain things. You start developing friendships along the way. So I think that's a positive outcome for me personally. A personal outcome.*

Outside of the tutorial sessions, friendships fostered in that comfortable setting endured. These connections could be a source of academic support — someone to approach outside of class when one did not understand work. Moreover, participants valued the expansion of their social circles as they had come to know and trust friends taking the same course.

8.3.1.5 I got to think like an economist and I got to do things differently

Emergent *disciplinary mastery brought about personal transformation*: students described how their learning led to a new perspective on real-world events, increased their interest in economics, and engendered a changed sense of self.

I gained a better understanding, 'cause I was listening to the radio and Brian Molefe was talking about the positive externalities, and I could understand what he was talking about… So I've realized that economics is everywhere we go and… it's even how you interpret certain things, like for instance when he was speaking and they all were saying Transnet should be privatized, and he was like no, you need to see the bigger picture, and he used big words like externalities, the positive and the negative. And I was thinking if I wasn't doing economics, I would have to google to see what he was talking about and was it even making sense… Economics is really opening my eyes to how the world works and how the concepts we learn in lectures and tutorials are applied in the real world. I feel like I can actively engage with someone on these things. I'd be sitting out having coffee with a friend and I could talk about whatever I've learnt in class. On my Facebook page, I've started liking pages where I've read articles, and it's very interesting. Before the tut, I'd never do that, just sit and read articles on our country's economy! But when I went to the tut it was just so interesting, I just wanted to find out more... I never thought of myself as person who'd sit and read articles - I'd rather watch movies! I've grown as a person. I became more self-confident and I think I now view eco's differently. I'm more interested in eco's, in studying eco's. It's more like my mind has been opened to a new kind of way of thinking. I got to discover myself. That's when I got to think like an economist and I got to do things differently.

The disciplinary understanding students had acquired was manifested in their enlightened engagement with everyday, real-world economic phenomena, in their personal lives outside of class time. They experienced the change in their worldview and their voluntary engagement with the discipline — the development of their economic gaze — as a personal change. For some participants, this combined with their shifting knowledge, interests, confidence and aspirations to bring about a new sense of themselves.

Not all participants experienced this range of outcomes to the same extent. Although all of the affinity meanings showed some variation across participants, in the case of Personal Outcomes there was a discernible difference between the four participants who had defined their Goals narrowly (in section 8.2.1.1 above), and the majority of the group. The former — who described their goals as being simply to pass the module — recounted a less substantial range of Personal Outcomes than those who had emphasized a desire for understanding or longer term plans as constituting their Goals. The Personal Outcomes of these four participants are captured in the final composite quote here:

Passing all three – I think that's been the really big thing cos I had really bad, 28%... now the lowest I've got was 52. It helped (with learning), 'cause whenever I didn't understand stuff I just had to go to my friends. If I didn't study I'd… have that fear that ok, I have to go prepare so that I just don't go blank on the group… I had to give up my free time to like study more. Can I be honest? (laughs) Then no… there was no personal outcome. Like… no, no. Honestly I cannot see the personal outcome.

While three of these participants did describe outcomes of their learning on the programme, these were all one-dimensional, highlighting respectively the academic performance benefits, social resources, and feeling compelled to give up more leisure time to study. By contrast, most of the other individuals elaborated on several of the elements described above. The fourth participant here admitted that he did not perceive any personal outcomes of his learning on the programme — despite having attended and

participated in almost every tutorial session and having submitted all of his written reflections.

8.3.1.6 Synopsis: Elements of Personal Outcomes

Participants described a range of academic, social and self-related Personal Outcomes. Most frequently cited was increased self-confidence, specifically around economic knowledge and verbal expression of their thoughts. This growth in confidence derived from the academic benefits — both course-specific and transferable metalearning — that they had gained, and from their enhanced interpersonal skills as a result of the group work. The networks and friendships formed in the tutorials strengthened social resources, another appreciable outcome for many students. As their mastery of an economic way of thinking grew, many participants experienced personal transformation at some level — a different view of real-world events, an increased interest in economics, or a changed sense of themselves. While this broad range of positive outcomes was experienced by most participants, a few reported somewhat narrower and less substantial personal impacts.

8.3.2 Influences of Personal Outcomes

Personal Outcomes — an ‘outcome’ affinity in the system — directly influenced Feelings (as shown in Figure 13).

Figure 13. Influences of Personal Outcomes

8.3.2.1 Personal Outcomes influences Feelings

Personal Outcomes of learning — newfound confidence, interpersonal skills and changed perspectives — led to positive emotions.

Positive personal outcomes has led to positive feelings about everything from economics as a field and my life in general. Our personal outcomes resulted in positive feelings about ourselves and about the group. When my mind was opened I felt happy and excited because I became confident. The more confident you are about your economic knowledge the less anxious and sad about economics you are. Whenever I understand a concept I feel really smart. I feel good about my growth and development in economics. I got more self-confidence, I learned to listen… and I feel I have grown from this. When I see myself growing personally and academically, I get really excited, overjoyed.

Anxiety and sadness diminished as confidence in their knowledge grew. Participants linked feelings of happiness and excitement to becoming aware of their own learning progress and personal growth. These positive feelings extended to a range of objects: themselves as individuals, the group, economics as a field of study, and life in general.

Findings from the elements and influences of Personal Outcomes are discussed further in Chapter 9. The following section describes the elements and influences of the Feelings affinity.

8.4 Feelings

Students' learning is coloured with a vivid wash of emotions arising from three major sources: the process of learning in itself; assessment; and the learning environment and interactions. From participants' descriptions of the range of feelings they experienced, I distilled the following sub-affinities:

- fear and frustration associated with trying to apprehend new ideas;
- finding joy in mastery of disciplinary concepts;
- anxiety in anticipation of assessments;
- affective responses to performance in assessments;
- enjoyment, engagement and enthusiasm regarding group tutorial sessions;
- more positive feelings and attitudes towards economics studies;
- a sense of contentment from feeling recognized and valued.

Further to these, recall from Chapter 7 that a few participants' descriptions of the influences of Economic Thinking suggested that feelings around existential or moral questions might be evoked in the process of acquiring the disciplinary perspective. Although not repeated here, this element of feelings is carried through to the synopsis of the sub-section and to the findings discussed in Chapter 9.

8.4.1 Elements of Feelings

8.4.1.1 I was stressed about actually getting things

The process of learning could be accompanied by *fear and frustration as students tried to apprehend new ideas.*

> *Thinking back at the first day when I actually attended the [Econ] 202 lecture, I was confused, scared. And during classes [lectures]… I used to like be so scared because – it is better for me if I go to classes, then you teach us. Sometimes my mind will be not there, but then I'll always feel like scared, ok now I'm not concentrating! … That happens if I'm at the back; I'm able to concentrate when I'm in the front. Yeah, so that feeling of fear, ok I'm going to fail, I don't know what [the lecturer] is talking about, ja, that fear… Because I was stressed about actually getting things instead of just trying to understand, so I easily got stuck on some things, because I'd try to understand it and it doesn't go in, try to understand - doesn't go in, try to understand - doesn't go in; then I'm saying argh, I guess, I don't know this stuff. Learning new concepts sometimes gets a bit confusing, you feel like giving up – like if I don't get something, especially when I'm alone, I feel very irritated, I just get very aggressive and I just feel like smacking something (laughs). If I don't get something I just get very, very irritated…*

Anxiety was linked to trying to take in new content. This was heightened in the context of formal lectures, where students might feel that I (as the lecturer) was imparting disciplinary content that they had to take in or absorb as fully and quickly as possible. Participants feared not understanding in class, feeling confused, and ultimately failing the module. Repeated, ineffectual attempts to get content to "*go in*" could detract from a focus on understanding, and lead to a negative spiral that undermined students' beliefs in their disciplinary competence. Feeling confused and stuck while trying to learn new

concepts was common, especially when studying alone, and could leave students feeling demotivated and frustrated.

8.4.1.2 It felt great learning and attaining economic knowledge

There is *joy in mastery* of disciplinary concepts, as well as relief, pride and a sense of accomplishment.

> *A lot of it affected how I felt, because things like finally understanding something, that would make me feel like, ahh great, I'd feel more enthusiastic to get on to the next thing and to just go on. From the beginning and feeling anxious, and feeling like, uuuuh I really don't know anything at all or I don't know enough, to getting to a place where – oh, wow, I actually do understand some things, and I feel like I can actively engage with someone on these things. I'm quite excited in the sense that I'm seeing myself achieving this goal, and you know there's that happy feeling that you have whenever you feel like, I think I'm getting there! I was very happy when I finally understood about elasticity. It felt great learning and attaining economic knowledge. I absolutely enjoyed finding the pieces and putting together the theoretical puzzle. Once you get it, it's a sense of relief, a sense of accomplishment – that you didn't give up on the speedbump, just pushed through it. I am proud of myself for what I managed to get right already.*

Making progress in learning was an emotional process. The cognitive move through stuckness to conceptual understanding had its affective counterpart: finally understanding a concept brought feelings of relief, accomplishment and emerging self-efficacy, which motivated participants to continue learning in a positive cycle (which might represent the converse of the self-reinforcing negative processes described under the previous sub-affinity).

8.4.1.3 Economics makes me very anxious

Anticipatory *assessment-related anxiety* was experienced by many students.

> *Yoh, economics makes me very anxious. I think it's because I failed it a couple of times so I'm always scared I might do it again. There is that fear in me because even though I managed to pass [Econ] 101 last semester, I still do not have a strategy to study economics. I really wish I knew how to overcome my fear of economics assessments. I was very much scared of the test before I wrote because of fear of the unknown. I was anxious about test 1. Test 1 was horrible. When I heard there were written questions – because we hadn't done written questions, we weren't sure what to expect. At first, before I wrote it, I was scared, 'cause you don't know what to expect and you don't know what you should be reading, whether it's enough or it's inadequate… Often, especially in multiple choice, I feel like I'm being tricked; that puts me on edge. A lot… a lot of stressful times.*

Participants' fear was linked to the possibility of failing, particularly for students who had had to repeat economics modules. While anxiety often arose from being unsure of how to prepare for a written test format, the more familiar multiple choice questions could also be experienced as treacherous.

8.4.1.4 So when I saw the results…

Test performance — good or bad — evoked a variety of strong emotions, which were closely related to students' self-belief and motivation.

> *So when I saw the results I was quite shocked. My first test… I was not happy at all about it, the questions were fair and doable, but I think we did not have enough time. You know it's a sad feeling I was having at first – especially when I look at test 1. When I write I'm so*

slow, so it ends up making me sad and angry at myself, because you know you're trying to say, this time let me push myself, and then at the end of the day you fail. The test - for me it was disappointing 'cause I kind of studied a lot that part, 'cause I know it wasn't an easy topic. And then when I got the result I was like, oufff, oh my gosh what happened? How am I supposed to learn this thing economics – is it a very very hard subject or should I drop or not…? The successes came in my test 2 result. I got 68 – that's when I knew I've got to keep going. So when I saw that I had passed, I was really surprised (and VERY happy - 57 is an achievement for me and I don't care what the next person may say!) For me, firstly I actually performed very well in test 1, and then what surprised me is that you were actually able to identify that it was me. And secondly, you acknowledged my performance and my effort. So with my test 2 it was more like, I just don't want to disappoint! So I felt like I had to perform. So actually that's where the feeling came in.

Poor performance in course assessments can cause disappointment and frustration, as was evidenced by the remarks about the first Econ 202 test, in which most students performed poorly. This led participants to identify possible reasons for their poor performance, or to question their own abilities with regard to the discipline. By the same token, doing well in tests bolstered participants' self-belief and motivated them to maintain their efforts. As noted by one participant whose test marks I had recognized in the tutorial, this might be linked to a desire to keep up performance and live up to expectations (their own, or those of the tutor and/or their peers).

8.4.1.5 It was fun!

The tutorial group sessions were fun — they were *enjoyable and engaging*, and participants were enthusiastic about attending and learning in that forum.

> *First of all I thought it was really fun. I enjoyed it, I enjoyed it. I found the tuts to be fun and engaging… I actually concentrated for the full two hours. I'm really enjoying the tutorials, I can't wait for the next class. When it came to Wednesdays going to the tut it was fun, and interesting … even though I felt guilty about [not] doing the work [written reflections], but then I wanted to go and attend. The tutorials are fantastic and I can't wait to learn more and better my knowledge. This thing will never get boring or unhelpful. It feels so good to learn something new every week. I think once you start to enjoy something, even though it's learning, once you start enjoying what you're doing, even if there's something you know you have to go and learn for a test you're writing that afternoon, you put some time, take the hours to learn the day before, just so you can make those two hours - make the sacrifice so you can come the next day. It's been really fun just getting with other people and try to learn through them. And also the fact that I was thinking like an economist – it just made things easier, plus exciting. And it was just like adventures – you get to discover things!*

Participants found the tutorial format conducive to learning, as they maintained concentration and were never bored. Being conscious of their own learning seemed to be an intrinsic part of the 'fun' element: collaborating with others, applying disciplinary ways of thinking and discovering new ideas felt "*like adventures*". Students felt strongly motivated to attend the sessions each week (even if they had not completed the requested work, or had other tests to study for).

8.4.1.6 I became more enthusiastic about economics

Many students expressed *more positive feelings and attitudes towards their economics studies*.

> *I think I love it more now 'cause I understand it more. The love develops as you get to know it. I like it more now since I know more or less when I can use it. I learned how to use it better, and as I use it I love it more. I loved this, what we're doing, microeconomics. I really enjoy it. It's just a different way of thinking. I like it. I became more enthusiastic about economics. It became so fascinating especially in this TC group, I actually went to ask one of those ladies at my school [student counsellors] to find out whether I can have three majors. I loved economics because of the TC group. It was more fun and understandable because of the games. Starting the actual studying is hard. But when you've started, it's like you don't want to stop. And when I'm studying eco's I just wish for that moment that I was doing eco's only and no other modules. I love it, I love it, I love it, I love it!*

Participants linked their positive emotional responses to economics to having acquired greater understanding of the discipline, and knowing how — and when — to apply it. The strength of these reactions ranged from 'liking' and becoming "*more enthusiastic*", to declarations of "*love*" from several participants.

8.4.1.7 I had that happy feeling

Participants conveyed a sense of well-being and contentment stemming from being part of the tutorial group.

> *There's this happiness that I was having – it felt like it's just like home in the TC groups… So I had that happy feeling inside me. I love the tut groups. It is enjoyable to work with other individuals and especially to share jokes and exchange ideas with other people. Being part of the TC group made me feel kind of important; valuable. I was very excited about being chosen to be a part of the group. [I] felt good 'cause people would listen when I speak in the tut..*

This contentment arose from *feeling recognized and valued* as a member of the group, both by peers (who would listen when they spoke, and with whom they could share ideas and jokes), and implicitly by me as the lecturer / tutor (who 'chose' them to take part).

8.4.1.8 Synopsis: Elements of Feelings

Encountering and trying to grasp new ideas in the discipline can be accompanied by fear and frustration, while mastery of these concepts brings positive feelings such as joy, relief, and a sense of achievement. Sometimes, adopting new disciplinary perspectives may induce sadness linked to relinquishing old worldviews, or a sense of moral dissonance if disciplinary values are experienced as clashing with one's own. The strongest negative feelings attach to assessment, which may generate anticipatory anxiety, while poor grades on assessment tasks give rise to disappointment and frustration. Contentment prevails in a comfortable learning environment where students feel recognized and valued. Together with peer interaction and enjoyable, engaging tasks, this can make the learning experience fun and increase students' enthusiasm about attending and participating in the activity. Along with the positive emotions attaching to mastery, this in turn makes for more positive attitudes and feelings towards economics.

8.4.2 Influences of Feelings

The final 'outcome' affinity, Feelings, directly influenced Goals (as shown in Figure 14).

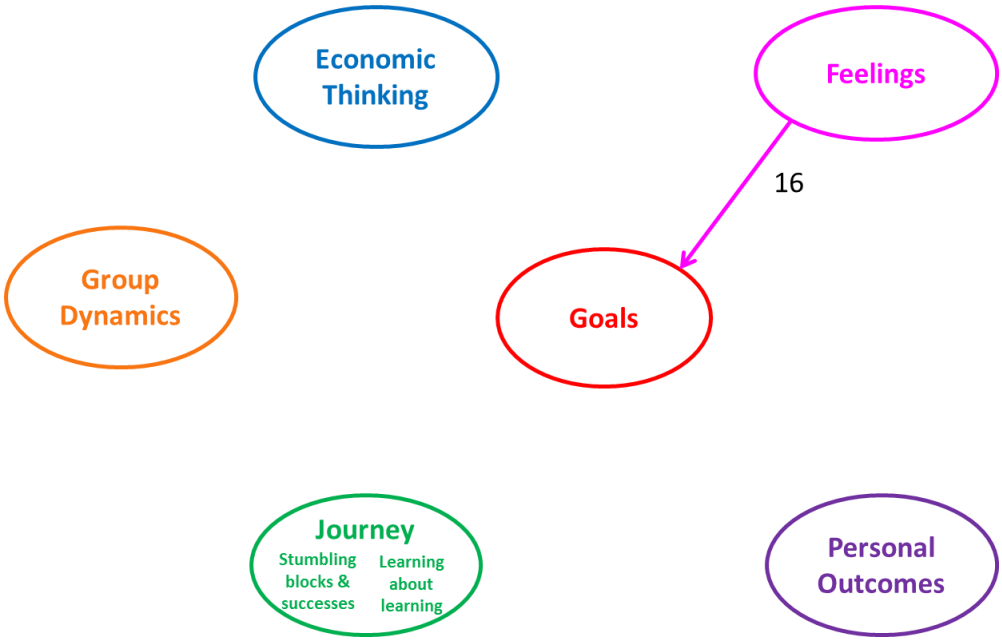

Figure 14. Influences of Feelings

8.4.2.1 Feelings influences Goals

Positive and negative feelings arising from learning experiences, and from their beliefs about themselves in relation to learning, affected students' goals.

The way I felt about the module affected my goals. Ultimately I do, as myself, I like doing good in the world. So if I feel that economic thinking, which has led me to my goals, will affect others positively, then I will feel better about what I'm doing… it's like a butterfly effect – it will just make me want to learn more, and do more, and affect more people. My love for economics has grown that I even want to become an economist. But I'm afraid of loving eco's! It's quite a [lot] of work, and I heard that third year includes stats, and I really suck at stats... Then this other part of me thinks that if you truly have some love for something and you're truly passionate about it then you can conquer anything. Economics is tough but I will major in it. I always feel like a person who can always achieve his goals. It has been a struggle that has not yet ended but I will not give up on my studying

toward economics. I feel like when I reach my goal I'm happy, but now it's important to feel the same when you're trying to reach your goal. I have set goals, but I think my feelings get in the way - negative towards things I don't understand. Positive and negative feelings that I experienced throughout this journey with the group made me appreciate the fact that goals are made of sub-goals. Meaning that, I can maximize my happiness by being happy by accomplishing the sub-goals, [rather] than the bigger, which might lead to disappointment if not accomplished. I think this whole semester I was happy… I passed my tests and if I didn't do well I just thought, better luck next time, I didn't dwell on failing. So I think I was forward thinking in terms of maybe my other tests or maybe the exam, that I might do better in the exam or other tests. [When] one talks about feelings, it's not only good things. Sometimes you learn something when you get a bad situation. You learn more and then you know what to do, now I need to change my techniques. And then that makes us to grow, to learn and to change stuff.

Participants' goals with regard to economics — particularly, the desire to pursue further study or even a career in the discipline — were shaped by their feelings. Positive feelings towards their learning experiences and their own abilities informed and reinforced these goals. In a similar vein, if disciplinary thinking could serve uses that accorded with students' own values, they might feel more motivated to learn. For some participants, these feelings might be tempered by apprehension about the demands of further study and doubts about their own abilities to meet those demands. Others expressed determination and confidence that they could reach their goals and surmount any difficulties they might meet. Negative feelings towards content they did not understand could hinder their attainment of learning goals; modulating the impact of emotions and maintaining a positive attitude through the learning process could help them reach those goals. However, negative feelings were also recognized as potentially important to learning, in that they could provide the impetus for a necessary change in approach that would enable greater learning and growth.

8.5 Links and loops among components of learning

This section briefly presents some participants' comments on the interrelatedness of the components of their learning. Chapter 5 provided a 'tour' of the SID that emerged from the focus group and was used as a way of representing the group's views on their learning of economics. I noted that the SID contained interlinked sub-systems, in which affinities were connected in self-reinforcing, positive feedback loops. The interviews did not set out to elicit views on the SID as a whole, focusing instead on exploring participants' meanings for each affinity, so this group-level holistic view is not comprehensively described in the data from the perspective of individual students. Further, because the SID was developed at group level, it is an aggregate — analogous to a mean or expected value — of the participants' views, so the experiences of any given individual within the group would not be expected to match it perfectly. However, descriptions offered by several students suggested that the circular, self-reinforcing nature of aspects of learning, as depicted in the SID, resonated strongly with their experiences:

Learning with the others and feeding off their intellectual capacities if I could say – it was nice, because when you get home and you start learning, it's just nice that you don't have to send you [the lecturer] an email to say I don't understand this, 'cause now you can understand it, and you can actually help yourself understand it, and the group also helps you understand it, so personally it's nice for me, with my goals and my feelings and my journey, they all interlink.

I do feel they're all interconnected in some way, because now economic thinking now that's your individual thing, but then that's also a group thing 'cause you can sit down as a group, as economists, and you think as a group, as economists. And that would bring new or refreshed personal outcomes in you as an individual, and that would spur some goals from what you know or what you don't know.

> *I really think that being in a group also helped us, and it also links to economic thinking…, because that's when you discover who you are… That's when I got to think like an economist and I got to do things differently… So it definitely has a link, through my learning journey. Because it was a very interesting journey for me and it encouraged me to grow as a person. Because the journey was smoother for me, my personal outcomes [were that] I became more confident and I developed as a person, I became motivated, and my self-esteem grew. So that's how I got to discover myself. I became more self-confident and… I'm more interested in studying eco's.*

These quotes from three participants highlight their perceptions of recursive interconnections among the components of their learning on the programme — the affinities described in this and the previous two chapters. They emphasize the role of the group in developing their individual understanding and disciplinary thinking, linking it with a sense of empowerment and increased self-efficacy in economics, and (in the second and third quotes) with an emerging disciplinary identity. They recognize the relevance of this advancing knowledge in approaching or redefining their goals — be they to understand, or to pursue further study or a career in economics. Self-relevant outcomes and positive feelings about the discipline (and themselves as learners thereof) enhanced their motivation and fed back into their goals.

The three participants quoted above all had positive experiences of learning economics, in which interconnected affinities reinforced each other to amplify their overall disciplinary and personal progress. It is conceivable that where students' construals of particular affinities are negative or unfavourable, the feedback loops among these might also compound their detrimental impacts, so that the system as a whole 'goes negative' in a self-reinforcing way. The implications of this systemic view of learning are considered further in Chapters 9 and 10.

8.6 Concluding comments

This chapter has focused on Goals, Personal Outcomes and Feelings, the tight links among them, and from them to the other affinities that comprise students' learning. While they are designated 'outcome affinities', they work together as a potentially self-reinforcing loop that feeds back into the system, and can therefore have strong impacts on learning. The SID offers a way of representing how students see their learning; its appeal as a medium for analysing and structuring the findings of the study in this and the preceding two chapters lies in the fact that it was generated by the participants themselves, as a group, and that its visual propositions about how the components of learning interrelate seem to align with individual students' views.

The structure offered by the SID is useful in synthesizing the affinities described in this chapter. The Goals affinity, although considered a secondary outcome in IQA terms, also has critical impacts on the Learning Journey and on Personal Outcomes; Goals is the nexus linking two sub-systems within the whole learning system — the cognitive, discipline-oriented Head loop, and the affective, identity-oriented Heart loop. In this portrayal of students' learning, it is through Goals that Personal Outcomes and Feelings affect and are affected by the course of disciplinary learning.

Students' construals of their Goals might amplify or mute the positive impacts of Group Dynamics and the tutorial tasks and format, described in Chapters 6 and 7, on their learning. If students' goals reflect a sense that they have freely chosen a course of study in which they will gain meaningful, self-relevant knowledge, positive aspects of the Heart loop are likely to reinforce each other and in turn have a larger impact on the cognitive aspects of learning. On the other hand, having a very narrow or undeveloped conception of Goals may stunt the potential for positive reinforcement among the related components of learning. It will be important to consider how students develop their conceptions of goals, and how pedagogical approaches may encourage fuller, more reflective, longer term perspectives on goals in relation to disciplinary learning.

While conducive disciplinary learning goals can provide the necessary motivation to steer the Learning Journey, this may still not be sufficient to ensure students consciously stay the course (as described in Chapter 7), choosing to 'fight' rather than 'flee' in the face of learning challenges. This seems to require that they draw on the

other elements of Personal Outcomes and Feelings as well, summoning forth resilience, hope, self-knowledge and self-belief (including self-efficacy with regard to the discipline), managing their emotions and taking ownership of their learning. Thus the 'Heart' for which this sub-system of affinities is named refers not only to affect, but also to broader associations of courage, will or spirit. While aspects of these self-related constructs may have deep biographical roots, they may equally be fostered in higher education, and again the question arises of how they might be developed in the context of disciplinary pedagogy.

The representation of students' learning in economics based on the SID comprises three discernible parts, which have served as the organizing frames for the data chapters. This chapter is followed by a short synthesis offering an overall view of the system and serving to conclude all three data chapters. Thereafter, Chapter 9 draws together findings from the data chapters in relation to existing literature and the theoretical framing of the study.

A SECOND TOUR OF THE SYSTEM: SYNTHESIZING CHAPTERS 6, 7 & 8

This short interleaf offers a system-level synthesis of participants' descriptions from Chapters 6, 7 and 8 — a 'tour' of the affinities and key interrelationships constituting their learning, which revisits and elaborates the initial 'tour of the system' derived from the focus group sessions, outlined in Chapter 5.

Group Dynamics (Chapter 6) emerged as the primary driver of students' learning in the TC-infused tutorial programme over the semester. Group Dynamics can be summed up as the interplay of positive influences that arose in the tutorial sessions and could potentially energize the system of learning. In students' rendering of Group Dynamics, peers and personal empowerment were as important as the pedagogy with which they were intricately entwined — the collaborative, constructivist approach used in the tutorials. The overwhelmingly positive nature of students' responses to the Group Dynamics affinity does not imply that the progress of their learning in economics was orderly and untroubled; it suggests, however, that the primary sources of trouble are not to be found in group processes. Contemplation of the photographic negative of the bright image we have of Group Dynamics might suggest further insights: the enthusiasm with which the students embraced the group work could point to some sources of trouble, in the often-ignored aspects of learning to which the group directly catered. Because Group Dynamics influences all the other affinities through its cognitive, affective and self-related aspects, its filaments can be seen to extend to the entire system of participants' learning of economics over the semester.

The Learning Journey and Economic Thinking affinities (Chapter 7) are largely about the cognitive and metacognitive processes and consequences of students' learning. Affective undercurrents are detectable throughout, and are captured more fully in the Feelings affinity (Chapter 8). The Learning Journey and Economic Thinking are both influential secondary drivers of students' learning in economics, and both are directly affected by the processes and interactions of Group Dynamics. Together with the Goals affinity, they form a positive feedback loop (a self-reinforcing sub-system) in the SID presented in Chapter 5: participants' progression in learning engendered a shift to an economic way of thinking, which influenced their academic and career goals, which in

turn ‘fed back’ to affect the course of learning. This was termed the Head loop because of its relatively cerebral nature, encompassing primarily conscious and deliberate aspects of learning. Again, some of the findings arise because participants’ experiences in the tutorials threw issues associated with the mainstream, lectured approach into sharp relief. Because the study involved level 2 students, their reflections at times included comments on their learning in level 1 economics.

Goals, Personal Outcomes and Feelings (Chapter 8) are the ‘outcome’ affinities in the representation of participants’ learning in economics. These affinities are closely tied in a sub-system that may be viewed as signifying the affective, volitional, and identity-relevant aspects of individual learning, termed the Heart loop in Chapter 5. Participants’ Goals — whether construed as immediate performance-oriented intentions, a desire to understand the discipline, or longer term plans and aspirations — provided the motivation that influenced the course of their Learning Journeys towards Economic Thinking (described in Chapter 7), and shaped the academic, social and intrapersonal outcomes they experienced. Students’ perceptions of their own personal change or growth, together with group processes and disciplinary learning experiences considered in Chapters 6 and 7, evoked a range of emotions regarding the discipline and themselves as learners. These Feelings in turn could lead students to revise or confirm their learning goals, making the Heart loop another potentially self-reinforcing sub-system.

Goals also mediated and fed back the influence of participants’ emotional responses and personal growth into the more cognitive side of learning (the Head loop linking the Learning Journey, Economic Thinking and Goals). Students’ conceptions of Goals can thus be viewed as connecting the cognitive to the volitional and affective aspects of learning — the Head to the Heart loop. Because of this, although the three affinities considered in Chapter 8 are designated ‘outcomes’, the circularity of the system and the interconnection of the two self-reinforcing loops mean that Goals, Personal Outcomes and Feelings may also be strongly causal within the system of students’ learning.

Taking a holistic, systemic view of students’ learning can serve to illustrate complex interrelationships among its various dimensions, highlighting crucial interdependencies, self-perpetuating constructs, likely locations of failure, possibilities for redemption or compensation across its components, and promising areas for intervention. This view informs the discussion of findings in Chapter 9, which follows.

CHAPTER 9
FINDINGS AND DISCUSSION: LEARNING IN THE TC-INFUSED PROGRAMME

9.1 Introduction

In seeking to deepen understanding of students' learning in economics, I used IQA processes to elicit rich descriptions from the participants in the TC-infused tutorial programme that was offered alongside mainstream Economics 202. Chapters 6, 7 and 8 presented the students' conceptions of and insights into the affinities that were identified in the focus group sessions as the components of meaning of their learning (Northcutt & McCoy, 2004). These were offered primarily in the students' own words (as elaborated in interviews or alluded to in their reflective writing), in the form of composite quotes elucidating the elements and influences of each affinity; these chapters and the system-level synthesis that followed them therefore did not engage with or seek confirmation from existing scholarship.

In this chapter, I abstract some key findings from Chapters 6, 7 and 8, and return to the literature to theorize the extent to which these findings may confirm, contradict or advance understandings of economics students' learning. Section 9.2 offers key findings, distilled and consolidated from the elements and influences of the six affinities. These represent a drawing together of common threads from all three data chapters, to arrive at composite conceptualizations that together describe how participants learnt over the semester of the study. Because of the complex, multidimensional nature of learning that emerged from participants' descriptions, and the systemic interconnections and circularities among the affinities, I will discuss the integrated findings in relation to the extant body of knowledge in the same section, rather than attempting to separate 'findings' from 'discussion'. To create an intermission for the reader in a necessarily long chapter, the discussion of findings in 9.2 is presented as two sub-parts: (A) 9.2.1 – 9.2.5 pertains primarily to the cognitive and metacognitive 'Head' loop, and (B) 9.2.6 – 9.2.10 centres on the volitional, affective and identity-related 'Heart' loop. Section 9.3 provides some concluding comments and points the way to Chapter 10, which reflects on the study as a whole.

9.2 Findings: Group, discipline and self in students' learning

Chapters 6–8 provided a complex and detailed portrayal from the participants of their learning in the TC-infused programme. As the synthesis preceding this chapter reveals, many of the descriptive findings that emerged from the data were closely related. I integrated recurring themes from these to abstract the key findings discussed in this section. The ten findings offered here transcend individual affinities, but the underlying systemic structure may still be discerned throughout these representations. In discussing each, I will also reflect on its relation to existing research in economics education (the three interwoven strands reviewed in Chapter 2), relevant threshold concepts-oriented scholarship (Chapter 3), and — where clear or underexplored resonances are evident — to pertinent broader scholarship.

A. COGNITIVE AND METACOGNITIVE SHIFTS

9.2.1 Constructing understanding through peer discussion and articulation

A shift towards active learning and more engaging, cooperative pedagogy can harness processes that lead to deeper understanding of economic concepts.

The light of contrast that the active, collaborative[33] approach of the tutorials threw on traditional lecture-based pedagogy was an immediate and prominent aspect for the participants. The learning they experienced in the tutorial groups was seen to be qualitatively different, and led to deeper conceptual understanding and more effective learning than the solitary, text-based memorization they had previously relied on in studying economics (section 6.2.1.3).

[33] In common with other studies in economics, I use the term "collaborative" interchangeably with "cooperative" to refer to the group-based pedagogical approach used in the tutorials, and not in the strict sense intended by Britton (1990, cited in Johnson, Johnson & Smith, 2013), where learning is unstructured and the roles of teachers and students are undefined.

Students' reflections concur with widely expressed views (reviewed in Chapter 2) that traditional pedagogy in economics delivers less than satisfactory learning (see for example numerous papers in Colander & McGoldrick, 2009; Goffe & Kauper, 2014; Hoyt & McGoldrick, 2012; Maier et al., 2012; Salemi & Walstad, 2010; Watts & Becker, 2008). Likewise, participants' appraisal of the effectiveness of the pedagogical approach used in the tutorials chimes with research into teaching innovations in economics, and its underpinnings in educational theory that advocates active learning approaches in which students are engaged in constructing their own knowledge (Miller & Rebelein, 2012; Perkins, 2006). Cognitive and social perspectives of learning point to the value of social interaction and discourse in students' meaning making and construction of disciplinary knowledge (Entwistle, 2009), and lay the foundation for the "growing consensus on the positive impact of … cooperative learning" (Emerson, English & McGoldrick, 2015, p. 2).

As noted in Chapter 2, most studies on active and cooperative learning in economics describe or guide the implementation of such approaches, or measure their impacts using quantitative techniques (Emerson et al., 2015; McGoldrick, 2012; Salemi et al., 2010). Although I did not set out to measure learning impacts, participants' self-reported improvement in understanding accords with empirical findings that collaborative approaches enhance students' learning in economics, particularly in terms of critical analysis and application (Marburger, 2005; McGoldrick, 2012; Yamarik, 2007). In contrast, Emerson et al. (2015) were unable to ascribe any difference in assessment performance, interaction levels, or interest to the group-related aspects of their cooperative learning intervention in economics. My findings, although arising in a different (qualitative) paradigm and context, indicate that group interaction and discussion can enhance learning in economics (as well as interaction levels and motivation), and offer substantiations and explanations that add depth to our understanding of how and why this may be so. Two significant mechanisms of learning based in group interactions came to the fore for participants in this study: the role of multiple perspectives, and the power of articulation.

First, hearing multiple explanations of economic concepts and problems from their peers in group discussion helped students to construct, correct, complete and internalize their own deeper understanding ("*Having people explaining different views, it comes*

together and forms an entire picture" — section 6.2.1.4). This aspect of discussion of the tutorial exercises — and the threshold concepts which they contained — emerged as a potent learning mechanism. The variously expressed understandings and explanations from different perspectives converged like multiple spotlights, or cumulative layers of detail, enabling participants within the group to build and correct their individual understandings.

The second, closely related process was that of spoken expression. The process of verbalizing in itself helped to create and refine students' economic understanding; articulating their understanding to their peers also allowed them to check and correct their conceptions, reasoning, and use of economic language ("*When you speak, you're learning*" — section 6.2.1.5). This spoken expression was a novel experience for many — traditional lectures did not require this of them, and most did not generally 'talk economics' in informal settings. Related to their recognition of the enabling impacts of discussion and articulation was participants' realization that mastering economic discourse is a critical part of disciplinary thinking ("*I'm using economic language*" — section 7.3.1.4). Their use of the language of economics was both a source of difficulty and a marker of disciplinary understanding, and its development was promoted by group discussion.

Appreciation of the mechanisms by which group interactions may enhance learning in economics is reflected in arguments for increased use of discussion within teaching (e.g. Hansen & Salemi, 2012; Salemi et al., 2010; Watts & Becker, 2008), largely based on individual academics' experiences in their own teaching. Work testing students' perceptions confirms their recognition of the conceptual learning and skill-development benefits of collaboration (Gleeson et al., 2006), but stops short of providing detailed, qualitative descriptions of these mechanisms from the students' perspective. The present study extends our understanding of how collaboration may enhance students' learning in economics by elaborating the two interdependent mechanisms of discussion and articulation.

While these paths to learning may remain underexplored in economics education, they accord with the established social and cognitive views of learning outlined in Chapter 2 (Entwistle, 2009; Ramsden, 2003) and with empirical findings that students' cognitive development is enhanced by both cooperation in problem solving and argumentation

(Bransford, Brown & Cocking, 2000). The process of constructing understanding through hearing peers' explanations resonates with variation theory and the suggestion that "(l)etting students be confronted with each other's views is a most powerful pedagogical tool" (Fazey & Marton, 2002, p. 239). The "multiplicity of voices" forms a self-correcting process that enhances argumentation as participants react to each other's ideas, add details or qualifications, or point out flaws in each other's reasoning (Reznitskaya & Wilkinson, 2015, p. 221). This process also aligns with the idea of "substantive conversation" proposed as a standard of authentic learning (Newmann & Wehlage, 1993), which emphasizes reciprocal, high-level interactions about disciplinary subject matter, and dialogue that builds on participants' ideas to enhance their collective understanding of the topic.

The "power of talk" to advance students' thinking, understanding and problem-solving is theoretically and empirically supported (Reznitskaya & Wilkinson, 2015, p. 219). Articulating one's own understanding by speaking in the group could be seen as talking-to-learn — akin to writing-to-learn approaches (Emig, 1977), another form of learning through articulation (Taylor, 2006). The relationship between language and thought has long absorbed scholars, and the use of talk to support student learning coheres with the views of social-constructivist theorists (Reznitskaya & Wilkinson, 2015). The processes described by participants in this study would seem to exemplify Vygotsky's view that "speech serves to organize, unify and integrate many disparate aspects … such as perception, memory and problem-solving" (John-Steiner & Souberman, 1978, p. 126). Spoken articulation is not only about conveying one's understanding — it also serves to build that understanding. Thus "(t)hought undergoes many changes as it turns into speech. It does not merely find expression in speech; it finds its reality and form" (Vygotsky, 2012[1934], p. 233).

Both processes can be recognized in the idea of "reflective discourse" required for transformative learning (Mezirow, 2000, pp. 10–11):

> … that specialized use of dialogue devoted to searching for a common understanding and assessment of the justification of an interpretation or belief … it leads towards a clearer understanding by tapping collective experience to arrive at a tentative best judgement. Discourse is the forum

> in which "finding one's voice" becomes a prerequisite for full participation.

This conceptualization points to the broader significance of participation and self-expression in the discursive process — both themes that recur in subsequent findings.

Within threshold concepts literature, the use of cooperative learning processes has thus far not been strongly emphasized or deeply explored, either in work on the pedagogical implications of the TCF, or on TC-oriented studies in economics (Flanagan, 2016), although there are evident complementarities and synergies with broadly sketched principles for effective teaching and learning (Davies, 2012; Davies & Mangan, 2008; Land et al., 2006). This study's findings around group discussion and articulation shed some light on how and why collaborative processes engendered within a group setting might be particularly effective at helping students to cross conceptual thresholds in economics.

Aspects of group discussion make cooperative learning approaches especially accommodative of some of the threshold characteristics (Meyer & Land, 2003) of much disciplinary learning. Group discussion allows students to change their minds and adjust their understanding of a concept as they articulate their own thoughts and hear those of others. This can ease their progress through the liminal phase of learning, during which understanding of a concept may alternately come into view and retreat. Discussion allows for oscillation between lay and disciplinary understanding of a concept (Pang & Meyer, 2010), and accommodates the "recursiveness and excursiveness" (Land et al., 2006, p. 202) that are likely to characterize threshold concept learning. While the multiple takes and detours often needed for threshold concept mastery are usually experienced over an extended period, articulation and discussion might allow relatively rapid advances in understanding: discussion is more fluid and mutable than writing or studying alone, and the immediate feedback and synergies generated within the group may intensify and accelerate the processes of recursion, deliberation and resolution that conceptual mastery entails. Thus the "messy journeys back, forth and across conceptual terrain" (Cousin, 2006, p. 5) might be made more rapidly in the company of peers.

Processes of discussion and articulation have much in common with those generated when students review each other's work (Land, 2016): both engage students in

sophisticated procedures of apprehending and evaluating peers' understandings of disciplinary ideas, comparing these to one's own, revising the latter, mentally or verbally rehearsing, and finally coming to authentic understanding and clear articulation thereof. These processes help students to cut their zigzag paths across the liminal space. Discussion with peers on the same course of study has the added advantage of being more likely to meet students where they are in their understanding than interaction with a lecturer who may have long since forgotten the experience of crossing a particular conceptual threshold (Land et al., 2006). Peers who have recently understood a concept might have a better sense of which of its features are sources of difficulty and stuckness, and would thus be well placed to offer a clarifying explanation, often in familiar or informal language: "*you [the lecturer] don't know what I find difficult; or the words that you use are different to those that people my age would use … Whereas my friend could also think that something is difficult …*" (section 6.2.1.2). Students helped to reach understanding by peers (rather than academics) incur lower emotional costs; at the same time, peers offering help deepen their own understanding and learn to articulate it clearly for others (Salemi, 2002). Moreover, group discussion and articulation directly support the discursive aspects of learning threshold concepts (Land, 2013; Meyer & Land, 2003): in hearing their peers' understandings of economic problems and expressing their own, students are afforded opportunities to acquire, practise and internalize the discourse of economics — within the safe space of the group, where there is little risk or fear attached to exposing their thinking (the latter point is revisited in further findings below).

9.2.2 Crossing a metacognitive threshold to 'understanding' and 'knowing why'

A change in pedagogy can transform students' conceptions of and approaches to learning.

Many participants juxtaposed their learning in the tutorial groups with their experiences in the traditionally lectured course, suggesting that the first two elements of the Learning Journey described in sections 7.2.1.1 and 7.2.1.2 could be seen as two sides of the same idea: "*putting all the information in my head in such a short space of time*" has its inverse in "*learning economics in a deeper way*". With lectured content, students

were likely to resort to a surface approach to their learning, relying on "*cramming*" to pass despite recognizing that this was not "*true learning*". These findings resonate with well-documented concerns in existing scholarship (reviewed in Chapter 2) about the pace and volume of coverage typical of lectured undergraduate economics courses. Through the conceptions of knowledge it creates, and/or the workload it imposes, this pedagogy may inadvertently encourage superficial approaches to learning centred on memorizing and reproducing information, instead of fostering authentic understanding (Biggs, 1993; Bloemhof, 2012; Dahlgren, 1978; Frank, 2005; Jackson & Ross, 2005; Simkins & Maier, 2009). In contrast to the rapid pace and one-way delivery of lectures, students saw the benefits of shifting towards a deeper approach in the tutorials. The sessions allowed them more time to construct meaningful knowledge (Taylor, 2006), encouraged fuller engagement (Zepke, 2013), and accommodated the iterative nature of conceptual learning (Land et al., 2006) by allowing repeated 'takes' on concepts.

Participants saw that their prior understandings of economic concepts that they had encountered in level 1 study were incomplete. They associated full or deeper understanding with being able to apply concepts, and emphasized the need to "*know why*" (section 7.2.1.2) — to grasp the reasoning behind theoretical ideas, including their expression in equations and graphs. While they acknowledged the supportive role of memorization in building understanding and lodging it firmly in the memory (Entwistle, 2009), and noted the importance of drills and practice for mastering economic content and its application, these had to be based on understanding in order to be meaningful. This deeper approach to learning was ultimately far more effective in enabling them to recall and deploy economic concepts.

The recognition that they had not fully grasped level 1 content bears out the learning concerns of numerous economics educators noted in Chapter 2 (e.g. Frank, 2005, 2012; Hansen, 2009; McGoldrick & Garnett, 2013). This adds to existing evidence that there is "teaching-without-learning" in economics (Jackson & Ross, 2005), and that some students may not have grasped the fundamentals teachers believe they have covered. Our understanding of this issue may be enhanced by considering the clear distinction students made between "*cramming*" (linked to traditional lectured delivery) on the one hand, and "*understanding*" associated with the desire to "*know why*" (arising from their experiences in the tutorials) on the other. This accords with the notion of deep and

surface approaches to learning (Marton & Säljö, 1976) considered in Chapter 2. Students taking a surface approach tend to "focus on the signs (e.g. the demand curve) as discrete elements; memorise information for examinations; and associate concepts and facts without the significance of context"; by contrast, taking a deep approach involves "concentrating on what is signified (assumptions, arguments, and conclusion) … and then trying to apply the concepts being studied to everyday experience" (Jackson & Ross, 2005, p. 65). Notably, students' intention is decisive in distinguishing these approaches to learning (Entwistle, 2009), and the need to "*know why*" described by participants matches the intention of understanding and seeking meaning which defines a deep approach. Participants' conjunction of understanding and application of concepts, which the ETC-based exercises promoted, again highlights the pursuit of meaning and context, and resonates strongly with a threshold concepts perspective and the view of learning as conceptual change (Davies, 2012).

In recognizing that their conceptions of knowledge and learning had changed, students identified a *Learning about Learning* shift that accompanied the specific conceptual shifts they experienced as they grasped content. They moved from a focus on absorption and reproduction of a body of content to a deeper understanding of meaningful, transferable principles, tools and language that they could apply in varied contexts. At the same time, instead of conceiving of learning as an individual, text-based process, participants came to see it as a socially constructed activity, as outlined in section 9.2.1 above. This could be characterized as crossing a metacognitive threshold — an idea that aligns with both threshold concepts perspectives (Entwistle, 2008) and earlier cognate theories on the development of students' conceptions of knowledge (Perry, 1970) and learning (Säljö, 1982) over the course of higher education, as synthesized by Entwistle (2009, p. 33):

> Both … show an increasing sophistication in the conceptualizations of knowledge and learning and also identify critical points at which students' conceptions appear to change radically — the pivotal position of acknowledging relativism in knowledge and the threshold through which learning at university level comes to be seen as seeking meaning for oneself.

Participants' comments describing elements of the Learning Journey, Economic Thinking and Personal Outcomes reflect evolving conceptions of learning that correspond broadly to those proposed by Säljö (1982, cited in Entwistle, 2009): from memorization of content, to acquiring knowledge for future use and application, to an emerging sense of learning as depending on understanding concepts for oneself, and thereby coming to view the world differently (a theme that recurs in subsequent findings). Enabling students to complete this shift could be regarded as an overarching objective of higher education; although it transcends economics, it is key to identifying effective pedagogies that foster deeper approaches to learning and thereby the hoped-for conceptual transformations that comprise disciplinary mastery. The change in participants' conceptions of learning over the course of the tutorial programme of this study suggests that the active, cooperative learning approach taken may have enabled or accelerated their crossing of this metacognitive threshold. Group discussion, structured by the tutorial tasks guiding conceptual development and application (Davies & Mangan, 2008), served to make the process of learning more explicit (Entwistle, 2009), and this seemed to play a central role in helping students to move from memorization to deep understanding.

Students' beliefs about knowledge and conceptions of learning can themselves be understood as a form of prior knowledge, which influences their learning engagement in economics as well as the ensuing learning outcomes (Shanahan & Meyer, 2003). The transition from school- to university-based studying typically causes dissonance in learning engagement, as students find that their accustomed approaches are in conflict with the demands of the university environment (Berg et al., 2016; Shanahan & Meyer, 2003). Successful negotiation of this aspect of the learning process demands that prior understandings be relinquished or reworked. In the study context, these difficulties seem to have persisted through level 1 study for many students.

Students described incidences of metacognitive stuckness, such as perseveration with ineffective text-based study methods and frustration at attempts to get the content to "*go in*" (section 8.4.1.1). This may be explained as failing to breach the threshold that gives on to new views of knowledge and learning. If students conceive of disciplinary knowledge as absolute — a fixed body of content, to be received from teachers and books, absorbed and reproduced in exams — this would block them from taking deeper

approaches to learning (Entwistle, 2009). Crossing this metacognitive threshold is arguably a prerequisite for constructing understanding of disciplinary threshold concepts. It requires not only that students reach a changed view of knowledge, but also that they develop awareness of, and control over, their own learning processes. This is part of the more specific notion of "metalearning" (Biggs, 1985; Meyer & Shanahan, 2004; Meyer et al., 2015), which will be revisited in further findings below.

The study confirmed that it was possible to pass (at least) introductory economics using a surface approach and without developing a sound conceptual understanding, as exemplified by the two participants who expressed incredulity at having passed level 1 without respectively understanding graphs and opportunity cost (sections 7.2.1.5 and 7.2.1.7). The possibility of passing introductory and intermediate levels without having developed the expected disciplinary proficiencies is a global concern in economics education (Davies & Mangan, 2007a; Frank, 2005; Green et al., 2013; Hansen, 2009), and will be pursued in Chapter 10.

As participants realigned their ideas of knowledge and learning, they also developed a more nuanced conception of understanding in relation to the disciplinary assessment requirements of level 2 study. They recognized that an initial sense of having understood theoretical content might not translate neatly into good marks on assessments, identifying possible reasons for this and elaborating some abilities or techniques that could enhance performance ("*When it came to the test I couldn't reflect or apply my knowledge on paper*", in section 7.2.1.9). In level 2 economics, there is a shift from multiple choice (used exclusively in level 1) towards questions requiring the application of concepts and theory to problems. To do well in assessments, students must be able to access, apply and convey their understanding and knowledge under pressure. Answering questions in a discipline-appropriate way requires being comfortable expressing conceptual understanding in calculations and graphs as well as verbal arguments. Participants' observations meet with agreement from Nicholson (2012), who, in discussing assessment in intermediate microeconomics, strongly advocates the use of problem-based questions precisely because of the demands they make of students (2012, p. 439):

> On many occasions instructors will have heard students say "I really understand this material, but just can't show it on tests." But even the

> slightest prod will reveal that they really do not "understand" … Only when students have to grapple with concepts explicitly and try to prove important results can they develop any sort of real understanding … Only analytical exercises can detect whether students really understand the material.

The struggle that some students experienced in trying to reach the high-level application demanded in assessments might be due in part to an apparent disjuncture between what students learn in lectures, and what they are required to perform in tests (Biggs, 1999). Some saw to it that they breached the gap themselves — participants mentioned using past assessments to familiarize themselves with the disciplinary approach and the requisite languages of economics, or practising with peers. Practising problem questions in this way accords with Nicholson's suggestion of using weekly problem sets that require students to "grapple with" application (2012, p. 439), although he cautions against using collaborative approaches, expecting many students to free-ride on the efforts of a few — a problem that was not reported by the study participants. Working through past test and examination questions might initially appear to be a strategic, assessment-oriented approach; however, in light of students' comments and Nicholson's insights, a more likely interpretation seems to be that they have recognized the potential of attempting varied applications to deepen and consolidate disciplinary understanding — in much the same way as learning a foreign language requires one to practise using it. This type of individual effort seemed to be a decisive factor in strong performance, and is related to students' metacognitive consciousness, motivation, and sense of responsibility for and control of their learning, discussed in further findings below. Issues around assessment also raise questions around lecturers' knowledge and practices that will be pursued in Chapter 10.

9.2.3 Activating the capable self through pedagogy and peers

Peer interactions and cooperative learning can enhance students' sense of personal empowerment and capability, and reduce endemic anxiety and self-doubt associated with learning.

A striking number of participants (including several who emerged as the strongest students in the group) said that at the beginning of the tutorial programme, they had felt intellectually inferior and thought that they had less economic knowledge than the others (section 6.2.1.1). This was often compounded by self-doubt in social situations — feeling "*shy*" or "*intimidated*" in exposing their thinking before others (section 6.2.1.8). There was a sense that many participants were coming into the programme from a position of self-perceived deficit, manifested in anxiety and self-doubt in the face of an unfamiliar approach to learning economics with peers they did not (yet) know well. Within a relatively short time, the group sessions helped them to manage and mitigate these feelings.

Issues around self-belief and building confidence have not been deeply explored in studies of learning in economics, despite their arguable relevance in a discipline often characterized as difficult. A subsequent finding (section 9.2.8) will examine affect more closely, and discuss the (limited) research on affective aspects of learning economics. The broader sense of feeling inferior and anxious that participants conveyed was not generally linked to specific features of economics (such as mathematical demands), and seems unlikely to be explained by disciplinary characteristics alone. This finding focuses on the ways in which the cooperative pedagogical approach appeared to help students to overcome this sense of deficit and become more confident about their abilities to participate in the group work and the discipline.

From participants' descriptions, three ways in which group processes helped to alleviate initial self-doubt and build academic confidence are discernible. First, their interactions in the group reassured them immediately that they were "*not alone*" in struggling with some content, and in feeling anxious and unsure of themselves — these were common, normal experiences (section 6.2.1.1 and section 6.2.2.1). Second, tutorial discussions could enhance their self-assessment of their competence in economics, as they found themselves making contributions to group work that added to or corresponded with their peers' understanding: "*some of the things that I actually thought of were helpful ... useful ... correct*" (section 6.2.1.6). Third, they realized that in approaching tasks as a group, they could learn from each other in a synergetic process that made it more likely they would be able to solve the given problems: "we can navigate around problems together til we find a solution" (section 6.2.1.1). These three processes may be summed

up as reassurance, self-efficacy, and collective capability; from the first tutorial session, participants could begin to restore the deficits in their own competence that many felt, and contribute to a sense of personal empowerment as they came to feel more confident of themselves and their abilities. Each will be discussed further below.

Threshold concepts-oriented work explicitly includes affect — the anxiety and unease that may be experienced en route to understanding — as an integral part of students' experiences of learning in any and all disciplinary fields (Schwartzman, 2010). Students' initial sense of being less competent than most echoes Cousin's observations (2006, p. 5) that "some students expressed the fear they were the only ones among their peers who did not comprehend difficult concepts", and felt "huge relief to discover eventually that other students were similarly confused". Group discussions in the current study revealed this shared trouble early on, so that students did not suffer in silence (Cousin, 2006) as they might have in a traditional lectured course with minimal peer interaction. Having received this reassurance that many in the group shared their feelings, students felt better able to deal with the anxiety, uncertainty and discomfort associated with incomplete understanding in the course of learning. In a participant's words, "being in the group helped me to realize that I will not just know everything" (section 6.2.2.1). Recognizing (and learning to tolerate) the inevitable uncertainty and unease associated with liminality is an important metacognitive insight that threshold concept learning requires of students (Barradell & Kennedy-Jones, 2013) — an aspect returned to in later findings — and having their emotions rendered normal and acceptable within the group was an important first step towards developing this capacity for participants.

The initial self-perceptions students described correspond to a lack of self-efficacy (Bandura, 1977): they doubted their capabilities in terms of economic knowledge and as contributors to the group. Self-efficacy has important implications for motivation, academic performance, and well-being (Bandura, 1993; Pajares, 2008) that recur in later findings. Perceptions of self-efficacy arise from four main sources: personal accomplishments, vicarious learning experiences, verbal persuasions, and physiological and emotional states (Bandura, 1977; Pajares, 2008). It appears that interactions in the tutorial groups afforded participants positive experiences of all four as they came to understand concepts and solve problems, observed their peers successfully doing the

same, verbally reassured and encouraged each other, and felt at ease in a comfortable, non-threatening environment. The opportunity for self-evaluation by benchmarking their knowledge against others during group work helped many of them to form more positive opinions of their own competence in economics ("*I learnt to trust my mind*", in section 6.2.1.6). In other words, the group provided cues signalling students' progress in learning that further enhanced their sense of self-efficacy in the discipline (Schunk, 1991). This growing sense of self-efficacy in turn increased students' intrinsic motivation to understand, and their readiness to engage with conceptual content (section 6.2.2.2), and seems to be an important reason why many experienced their learning in the groups as personally empowering.

Personal empowerment also appeared to derive from the sense of collective capability and responsibility that emerged in the tutorial groups. This collective capability is tied to both of the previous findings: the collaborative, discursive processes that effected conceptual learning, and participants' changed conceptions of knowledge as meaningful and socially constructed. Participants increasingly came to see peers as a significant additional resource for learning, in the tutorial sessions and beyond. Students who might initially have been reluctant to request help from peers they saw as academically stronger would now do so more readily, confident of a positive response (section 6.2.1.2). As the sessions continued through the semester, the sense of the group members taking collective responsibility for their learning strengthened — "*we shifted view from 'what am I trying to get out of it?' to 'what can we get out of it but together, as a group?'*" (section 6.2.1.7).

Participants saw the value of thinking and learning as a collective — a counterpoint to much of their experience in the largely competitive, individualist traditions of 'Western' higher education that prevail in South African universities (Backhouse & Adam, 2013; Kasl & Elias, 2000) and are based on "a fundamental conception of the thinker as solitary rather than embedded within a human community" (Cozolino & Sprokay, 2006, p. 13). This culture "conditions us against collaborative thinking by conditioning us to think adversarially in terms of winning or losing, of proving ourselves smart, worthy or wise" (Mezirow, 2000, p. 11). Students' comments suggest that within the group, competitiveness was replaced by solidarity and synergy, which promoted their conceptual and metacognitive development.

Learning within the group was felt as personally empowering to individual students. Participants identified with and related directly to each other as peers on the same level — as they variously noted, they were of similar age, had similar goals, and shared a discourse (sections 6.2.1.2 and 6.2.1.7). The essential factor appeared to be that they were learning with and from each other as peers, and no longer had to rely on me as the lecturer: "*There was a chance where it wasn't the lecturer telling us what's going on. It was like getting information from someone who was on the same level as I was*" (section 6.2.1.2). Resolving problems and constructing knowledge amongst themselves, on a basis of mutual respect for each other's abilities despite variation in individual strengths, enhanced not only students' conceptual understanding and perceptions of their capabilities in economics, but also their sense of responsibility for and control over their learning. Thus "*it's helped me to be in a group, to understand the concepts and be able to apply it on my own now rather than waiting to hear what someone else has to say*" (section 6.2.1.4).

The idea that being part of a group might in itself enhance one's self-concept and sense of capability is suggested by self-expansion theory (Aron et al., 2004) — the view that people seek to enhance their "potential efficacy" by expanding their self-concept to include to some extent the resources, perspectives and identities of close others. This might include groups to which one belongs: "we include groups in the self because doing so increases our confidence that we can meet the demands of our world and achieve goals" (2004, p. 122). The applicability of self-expansion theory in educational contexts has not been explored. In the current study, this perspective suggests a further dimension to our understanding of why students reported feeling empowered and more capable, and why Group Dynamics emerged as such a significant component of their learning on the programme. The affective and identity-related significance of a sense of belonging to a community is closely enmeshed with the idea of collective capability and responsibility, and is discussed more fully in section 9.2.9 below.

The shift of responsibility for learning to the group was tied to the format of the tutorials, with its emphasis on understanding being constructed through group discussion of topical problems, rather than being formally taught by a lecturer or tutor. This entailed the deliberate dismantling of the traditional roles and power relations of the authoritative teacher and subordinate students dispensing and receiving knowledge

respectively. As tutor, I consciously transferred as much authority to the group as was feasible (Mezirow, 2000) and remained in the background, playing a primarily facilitative role; this I did through careful observation of the group's readiness and relying on intuition and experience. The participants were collectively responsible for making meaning and constructing their knowledge, guided and prompted by the tutorial tasks. A pedagogical format that entrusts responsibility and transfers authority for learning to the group might be experienced as empowering because it signals to the students that the teacher deems them capable and meriting of that trust. It offers a very direct way of "helping students come to view themselves as active agents in producing knowledge" (Barradell & Kennedy-Jones, 2013, p. 8).

Issues of empowerment through pedagogical approaches such as this are congruent with, but arguably underexplored in, threshold concepts scholarship. The approach taken in the tutorials shares some features of problem-based learning (PBL) (Savin-Baden, 2006, 2016), and in a similar way prompted students "to see learning and knowledge in new ways" (2006, p. 162); it brought challenges to identity, knowledge and power that provoked personal and pedagogical shifts (for both students and teacher, though the focus here remains on the former). Savin-Baden notes that power associated with pedagogy is a potentially troublesome concept (requiring a reworking of perceptions and roles), adding that the implicit or intended transfer of power in the learning context may be complicated by personal, institutional or disciplinary influences — "the coded practices that underpin our teaching processes, the way we manage power in learning contexts and the decision about what counts as knowledge, what does not and who decides this" (2006, p. 171). Within the tutorial programme, the transfer of power occurred at a smaller scale than in fully fledged PBL: participants continued to attend mainstream lectures and completed the given syllabus and assessments alongside the tutorial sessions, I decided on the tutorial topics, and the exercises provided the content and questions that guided discussion. Nonetheless, the sense of being responsible for constructing their own understanding through group discussion appears to have been sufficient to bring about significant shifts in the way participants viewed themselves as learners.

Consideration of the possible sources of participants' anxiety and lack of confidence points to a substantial anticipatory or pre-liminal component: they were affected from

the outset, before they had even begun to engage with the threshold concepts in the exercises. This suggests that the source of their insecurities might lie in part in their biographies, in past and contemporary experiences of learning, including previous economics and other courses at university and their earlier schooling history. These experiences shape the "stories of themselves" (Taylor, 2006), which are largely unconsciously held but form a potentially self-perpetuating part of students' frames of reference (Mezirow, 2000). If these self-beliefs are negative and limiting, they would need to be reconstituted as a "new, more capable story" (Cozolino & Sprokay, 2006) to enable students to advance in learning.

In terms of the capability approach (Walker, 2005, 2015, drawing on a body of earlier theoretical work by Sen), students' capabilities — broadly conceived as their freedoms or opportunities to achieve what they value, including participation in learning — may be influenced for better or worse by the impact of educational conditions on their identities as learners. This view is borne out by a participant's reference to high school teachers that "*fed us with a lot of discouraging words so that we will perceive ourselves as failures*"; that he had begun to reconstitute himself as a learner is evident in "*I realized that in life there are things that a person must discover for him[self] … I tried to forget about things that were discouraging me*" (section 7.2.1.8). This perspective on students' self-concepts as learners corresponds with the idea of "pedagogical stance", which is influenced both by the choices students make in a learning situation, and by the individual learner history they bring to the learning environment (Savin-Baden, 2016).

Coming to see oneself as a capable learner seems to have clear threshold properties, centred in the transformative capacity of a reconstituted self-concept. Until students attain this view of themselves, their learning is likely to be held back by their self-beliefs and the learning choices that ensue. Students' conceptions of themselves as capable learners can be engendered by pedagogical approaches that affirm and signal their capability in the eyes of the teacher; by their sense of collective capability; by their growing individual self-efficacy beliefs; and by the underpinning conception of learning as the social construction of meaningful knowledge, in which they are active agents (as discussed in section 9.2.2 above). Together these elements can encourage them to rewrite their views of themselves as capable learners. Changes in students' conceptions of and approaches to learning, and in their views of themselves as learners, have been

recognized as transdisciplinary threshold concepts (Savin-Baden, 2016) or necessary shifts in traversing the broad liminal process of becoming a student in higher education (Berg et al., 2016; Cousin, 2014). These metacognitive and identity transformations might be seen as thresholds to thresholds: together they can activate a capable self to embark on the further transformations required by disciplinary learning.

9.2.4 Seeing the use of it: From stuckness to meaningful conceptualization

Abstractness of economic concepts is a significant source of difficulty and stuckness; seeing their use (or usefulness) renders concepts meaningful, facilitates understanding and enhances students' sense of agency.

Most participants felt they had progressed towards deeper and more complete understanding of economic concepts over the semester, but this transition had not been easy or linear: it demanded time and effort, brought periods of uncertainty and confusion, and was not always completed. A sense of stuckness regarding certain concepts or economics in general appeared to be a common experience. Overall, the students' descriptions of their routes towards disciplinary understanding match those mapped by the TCF. This correspondence is particularly evident in the features of difficulty and stuckness considered in this finding, and in the transformative and other threshold properties of reaching understanding discussed in section 9.2.5.

There are as many variants of experiences of difficulty as there are students. Nonetheless, it is possible to draw out a few topics on which participants' considerations of content difficulty and the resultant sense of feeling stuck seemed to converge (section 7.2.1.5): graphical analysis, together with the closely associated modelling and simplifying techniques, and elasticity. These were all ideas and processes they had encountered in level 1 economics, yet still battled with despite having passed introductory modules. Difficulty seemed to arise from the abstract, theoretical way in which concepts and techniques were typically presented in lectures, which seemed to have little to do with reality. It seems that in the traditional pedagogical approach, the connection of formal knowledge to students' everyday knowledge may not have been substantive enough to enable deep comprehension of theoretical concepts and techniques. Making simplifying assumptions and applying *ceteris paribus* techniques

could appear illogical and even illegitimate to a student who is not fully aware or accepting of the underlying premises — it could seem to be "*crazy*" or "*getting sucked out of someone's thumb*" (section 7.2.1.5 above). Since this is a precursor to representing the situation graphically, not understanding these modelling procedures would stall students' understanding of graphs. Further, even if students had a "*basic understanding*" of graphs and their use, they could find it challenging to "*shift them and use them, apply it to the question*" (section 7.2.1.5). In other words, deeper understanding was required for tasks involving application and analysis rather than mere algorithmic manipulation, and students would need to move from being stuck in superficial, mechanical approaches, towards high-level conceptual learning.

These comments recall various types of troublesome knowledge (Perkins, 1999) as it relates to economic concepts (Shanahan & Meyer, 2006), as sketched in Chapter 2. Participants implied that graphs committed to memory without full understanding could have features of routine and meaningless "ritual knowledge", not supported by a grasp of the underlying conceptual or mathematical models or the ability to articulate the real-world relationships the diagrams represent (also noted by Strober & Cook, 1992[34]). This type of knowledge would also be "inert" if not actively used or connected to real world events. The scepticism some students expressed around modelling techniques suggests these might be experienced as "alien". As noted in Chapter 2, not recognizing the validity of abstraction and the relationship of abstracted concepts to real situations will make it difficult for students to grasp the logic and use of these theoretical constructs; moreover, their perceived irrelevance may undermine students' motivation to persevere with attempts to learn them (Mendeloff, 2008; Van der Merwe, 2006).

Similarly, the troublesome nature of elasticity appeared to stem from its abstractness and (initial) perceived unrelatedness to real contexts. Students described their struggles with it in vague terms — it was "*a strange animal that made life difficult*" — suggesting again that they experienced ritual, inert and alien properties. However, "*once you start getting why it's there and why it's important and how it works … you tend to remember it and use it*" (section 7.2.1.5). It seems that seeing elasticity in the context of

[34] As observed in Chapter 2, graphical analysis is often characterized as one of the languages used in economics to describe theoretical concepts and relationships. Hedges (2008) believes some students' difficulties with graphs lie in the fact that they are not strongly visual learners, and that the problem is one of language acquisition and translation rather than lack of understanding in itself. Participants' views seem to support the explanation of Strober and Cook (1992).

applications addressed those causes of trouble as students came to understand its purpose. This in turn would make the logical formulation of elasticity as a measure of the relative responsiveness of a variable self-evident; and from there it would be become relatively straightforward to remember, apply and interpret the results of the appropriate formula. The frequency of responses identifying elasticity as problematic suggests that many students did not understand the purpose or meaning of the concept until late in their studies, while a few did not come to understand it at all. Elasticity is a composite concept that has to be understood in relation to other concepts (Davies & Mangan, 2007a; Thomas, 1987), and so it seems likely that for many, elasticity was also "conceptually difficult" knowledge, which led to "a mixture of misunderstanding in varying degrees and ritual knowledge applied in critical 'gaps'" (Shanahan & Meyer, 2006, p. 104), as reflected in some of the explanations students volunteered (section 7.2.1.5).

The mathematical aspects of economics were not preponderant in participants' reflections on sources of difficulty and stuckness. This is surprising, given the mathematics embedded in many economic constructs, and the empirically established role of mathematical ability in performance in economics (see for instance Benedict and Hoag (2012), Bokana and Tewari (2014), Owen (2012), Siegfried et al. (1991) and others mentioned in Chapter 2). This may be due to the nature of the tutorial tasks, which foregrounded verbal conceptual articulation and the use of graphical analysis — which is also the approach I took in mainstream lectures — so that the underlying mathematical relations might not have been at the fore of participants' recollections; or it may be that these participants had passed their first year of economics — many within BCom and Accounting degrees with mathematical prerequisites — and so had sufficient mathematical competence for this not to be an issue in Econ 202. The relative absence of references to the mathematical demands of the discipline should thus not be taken to imply that they do not present difficulty for students. Indeed, the opposite is suggested by a participant who was repeating Econ 202, having taught himself high school mathematics after failing the course on his first attempt two years previously: "*I failed [because] I had a problem with Maths … So I decided to study high school Maths ... [So then] it was easy to understand the equations and the graphs and so on*" (section 7.2.1.8). Nonetheless, the data overall does not add significantly to our understanding of the nature of mathematical difficulties that students may experience.

The participants confirmed that another source of difficulty may lie in the language through which economic understanding is expressed (section 7.3.1.4). Language plays a central role in conceptual development, as noted in section 9.2.1 above; the threshold concepts view of disciplinary learning likewise emphasizes its discursive nature. For some participants, "troublesome language" (Shanahan & Meyer, 2006) manifested in disciplinary terminology that left them confused or feeling alienated from their understanding; they had to recognize that the distinct discourse of economics requires mastery rather than the translation or simplification of ideas to everyday language. Applying economic concepts demands a "'precision' of thought and language" that students often find difficult (Shanahan & Meyer, 2006, p. 112). In keeping with other findings in economics and related disciplines in South Africa (Bokana & Tewari, 2014; Ojo, 2012; Parker, 2006), these difficulties could be compounded for students whose mother tongue is not English, who might have to ''read twice" or "google first" to reach clarity. The significance of reaching competence in the language of economics is returned to in the next finding.

For the students in the study, gaps in "tacit knowledge" — for instance, shared practical understanding of the workings of economic institutions such as markets and government (Perkins, 1999; Shanahan & Meyer, 2006) — did not emerge as sources of trouble. Similarly, difficulties did not appear to derive from misunderstandings of "basic concepts" (Davies, 2012; Davies & Mangan, 2007a) — in other words, problematic lay conceptions of economic terms or phenomena. This accords with what one might expect of second-year students — any problems relating to this basic level of awareness and understanding should have been largely resolved during the course of their first year of study. Difficulty and stuckness in the current study were instead associated with discipline — and particularly "procedural" or "modelling" — threshold concepts (Davies & Mangan, 2007a), and their troublesomeness appeared to stem mainly from their ritual, inert, or alien features.

These aspects of troublesomeness are intertwined and difficult to distinguish (Shanahan & Meyer, 2006) but nonetheless provide insights into sources of confusion and incomplete understanding that have implications for how these concepts might be more effectively taught and learnt. Seeing concepts in the context of applications brings out their relevance for students, and facilitates understanding and recall. When participants

saw the usefulness or applicability of economic concepts in real contexts (on a personal or broader scale), their knowledge became more meaningful, and they felt motivated to continue learning. For instance, some explained how the relevance of the concept of elasticity became apparent to them when they used it to analyze market power and price discrimination, and said they could recognize its applicability in everyday contexts when contemplating the behaviour of real-world firms. Seeing the relevance and applicability of theoretical concepts in this way can help students' learning to "solidify" (section 7.2.1.3) so that their understanding is internalized and easily accessed. The importance of seeing the use of particular concepts is closely linked to the idea of deeper approaches to learning motivated by a need to "know why", rather than simply memorizing graphs or equations, as discussed in section 9.2.2 above. It also reflects the conjunction of understanding and ability to apply that inheres in the TCF (Davies, 2012).

The centrality of the perceived usefulness and applicability of knowledge to the progress of learning was strongly evidenced in participants' reflections on Economic Thinking and its use in their own lives. Economic Thinking — comprising the broad logic of economics, its constituent conceptual tools, and by implication the language through which these are expressed — could be used to explain and interpret events, both personal and in the world at large. Participants used images suggesting that this disciplinary perspective was an asset that empowered them — a "*tool*", a "*key*", or "*ammunition*" (sections 7.3.1.3 and 7.3.2.1) Thus attaining meaningful, useful knowledge brought a sense of autonomy and agency (sections 7.2.2.3 and 7.3.2.2). This is a direct counterpoint to the perceptions of abstract, meaningless, irrelevant theoretical knowledge sketched above as a source of cognitive stuckness and demotivation.

In general terms, beyond the tutorial exercises, participants concurred that overcoming stuckness on specific concepts centred on finding alternative explanations from a range of sources — peers, tutors, lecturers, other texts, online videos — so that multiple perspectives could come together to illuminate the concept, in essentially the same process described in the discussion of collaborative learning in Chapter 6 (in section 6.2.1.4) and section 9.2.1 above. This approach to dealing with content difficulties also revealed students' effective use of self-regulated learning strategies (Winne & Hadwin, 2008). Echoing the finding in section 9.2.3 above and recalling self-expansion theory

(Aron et al., 2004), moving through stuckness by drawing on the resources and perspectives of others could be experienced as expanding one's own capabilities: "*It actually improves the way you think for yourself … when somebody comes in and enlightens, then you become able to think more about it, around it, and then you expand the capacity of how you understand certain things*" (section 7.2.1.6).

Mechanisms for moving through stuckness — particularly with graphs or modelling and elasticity — are suggested by participants' comments on the tutorial exercises (section 7.2.1.3), and emerge as a corollary of attributing difficulty to abstractness. First, as already noted, engaging with the concept in an applied context could give students the 'why' that paves the way for understanding — and the participants felt that the tutorial activities were based on relatable applications that made the use and relevance of the concepts under discussion clear: "*(W)e were looking at different real life situations and applying those concepts … I like that because it doesn't feel useless*" (section 7.2.1.3). Moreover, the exercises broke problems down into short sub-questions, and guided students through the steps of modelling — identifying the critical variables, simplifying, and abstracting away from less relevant details — in the process of constructing their analysis. Participants found this helpful: "*the short questions actually helped … this is the core of what they want from me*". The scaffolded activities led up to requiring the students to draw graphs (and/or compose analytical explanations) themselves. Having to construct their understanding in this way made "*a huge difference … because this time you're able to interpret better, because now you know why*". Taking apart and making explicit what was required allowed students to take the necessary steps to understanding, and arrive at their own solutions.

Harnessing the cooperative learning processes described in Chapter 6 and highlighted in section 9.2.1 above meant that participants could progress through the abovementioned steps to understanding by articulating their reasoning to peers, having their mistakes corrected along the way, and hearing multiple interpretations. In this way, students could develop full yet focused, discipline-appropriate responses to relatively challenging problems that they would probably not have been able to answer had they been couched as direct, single questions that skipped over (or assumed full awareness of) the intermediate steps required to answer them. This could be described as moving

into the "zone of proximal development" (ZPD) (Vygotsky, 1978) — a metaphor that resembles the liminal space of the TCF in many ways (Cousin, 2006). The ZPD is:

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers. (Vygotsky, 1978, p. 86)

Constructivist learning theory and qualitative research with economics students (Perkins, 2006; Reimann & Jackson, 2006) both indicate the importance of applications and examples for promoting engagement, understanding, and meaningful learning linked to participants' experience. Similarly, the potential benefits of scaffolded learning tasks in economics have been documented (see for example Dubas & Toledo, 2016; Green et al., 2013). The tutorial tasks had commonalities with many of the active learning pedagogies advocated in economics (outlined in Chapter 2), and the confirmation of their effectiveness by the present study is not particularly surprising. However, participants' descriptions of the impacts of working collaboratively through the exercises add to our understanding of processes for facilitating the move from stuckness to meaningful conceptualization in economics. Furthermore, in recognizing that they could apply "*that same approach, or same way of doing things that we applied in the tut*" (section 7.2.1.3) to other problems, participants revealed that they had now mastered some of the implicit rules or procedures of economic analysis that comprise the "underlying game" or "episteme" of disciplinary practice (Land et al., 2006; Perkins, 1999). "Knowing why" and seeing the use of concepts emerged as central to moving through stuckness, and was associated with a sense of empowerment and agency that participants appeared to derive from having attained meaningful knowledge. This suggests that the significance of meaning in learning is not only about making sense of concepts in context; meaning also denotes that knowledge is experienced as personally relevant, as having value and purpose, and as pertaining to issues about which students care. Wenger proposes that "(m)eaning — our ability to experience the world and our engagement with it as meaningful — is ultimately what learning is to produce" (2009, p. 210). Meaning in this sense is also indicative of identity relevance; it is closely linked to the transformative and identity aspects of threshold concepts scholarship, and like these aspects of the TCF, resonates with Mezirow's views on

transformed meaning perspectives (2000). These implications are revisited in later findings.

9.2.5 Breaking through to new views

Moving through stuckness and reaching understanding of particular economic concepts or techniques can be an important and revelatory learning breakthrough.

The significance of reaching understanding of particular economic concepts and techniques follows closely from participants' experiences of difficulty and stuckness, and adds to the sense that their learning in the study context closely matched the view of learning inherent in the TCF. The focus of this finding is primarily on the impacts of conceptual changes students went through over the course of the semester. Learning was experienced as a transition, graphically captured by the focus group in the image of the Learning Journey. Certain concepts could be *Stumbling Blocks* along the way, which had to become *Successes* in order for participants to arrive at Economic Thinking. Those who had navigated such changes recounted reaching new perspectives — in their understandings of specific concepts, in newfound recognition of interrelationships among concepts, and in their worldviews. These add to the descriptions of liminality, of stuckness (and how paths might be forged through it), and of metacognitive thresholds crossed, which also resonate with the TCF as discussed in the preceding findings. The transitions and thresholds participants traversed engendered a changing sense of themselves within the discipline, with associated affective elements that are discussed in later findings.

In this study, I did not set out to evaluate or verify students' mastery of the concepts covered in the tutorial tasks beyond their self-reported assessments of their own learning, so there are limits to what may be concluded from the data with regard to the conceptual changes effected. However, participants' accounts strongly suggest that many did cross conceptual thresholds and experienced the accompanying changes in perspective as the TCF would anticipate — they alluded to transformative, integrative, irreversible, and sometimes troublesome changes in their understanding of particular concepts. This appeared to be the case for many participants even in a second-year context, where one might expect some conceptual thresholds to have been crossed

already. The concepts and techniques participants most frequently identified in reflecting on *Stumbling Blocks and Successes* — in other words those that might hold threshold qualities (for some at least) — were opportunity cost, marginal analysis, elasticity, and graphical modelling techniques (section 7.2.1.7).

It is not surprising that graphical analysis and elasticity feature strongly in this list, given that participants emphasized these as sources of trouble or stuckness. Opportunity cost was not mentioned by as many participants, with several saying that they had grasped it in first year, but for those who had not done so, coming to understand it in the current module had a major enabling impact. All of the concepts and techniques participants identified were embedded in the tutorial exercises (Davies & Mangan, 2006c). As explained in Chapter 4, I drew on the 'web' of likely threshold concepts offered by Davies and Mangan (2007a), and used tutorial tasks emphasizing the microeconomic concepts pertinent to the (pre-determined) Econ 202 syllabus (see Figure 2). To some extent it is therefore to be expected that the concepts participants named coincided with those nominated by Davies and Mangan. Moreover, all are considered essential principles that are covered in level 1 economics. With gaps in their understanding of such fundamental concepts, it is no wonder that participants encountered difficulty with their use in level 2 topics — and experienced finally grasping them as revelatory. There is evidence in the data that these concepts and techniques acted as portals to learning progress; that understanding them often entailed a troublesome transition; and that grasping them led to a transformed view of the subject, a disciplinary perspective on the world, and a changed sense of themselves in the discipline (Meyer & Land, 2006).

First, as noted in previous findings (especially section 9.2.2 and section 9.2.4), moving towards understanding of economic concepts was not a smooth and linear process. In line with the TCF, participants' learning transitions often involved recursion and repetition, having to rework preconceptions, and tolerate incomplete understanding, as exemplified by this student's description of her ongoing journey to understanding elasticity: "*... that's when I began to question my understanding of elasticity, because I was thinking that I understood it! ... I'm still trying to get there — I'm not crystal clear on it ... It's in my understanding; that's all I can say*" (section 7.2.1.4). Their descriptions reflected an acceptance that coming to understand particular concepts was a

work in progress, and a recognition of the importance of practice, repetition and time. Progress towards conceptual understanding also varied amongst participants — some found mastery of certain concepts especially difficult, others said they had not struggled at all, and a few felt they had still not reached full understanding (particularly of graphical techniques and elasticity) by the end of the module. These views accord with threshold concepts theory (Cousin, 2006; Meyer & Land, 2006; Schwartzman, 2010) and empirical findings from studies with economics students (Davies & Mangan, 2009, cited in Davies, 2012).

Several properties seemed common to students' experiences of reaching understanding of these disciplinary concepts (section 7.2.1.7). They recognized that these ideas were ubiquitous, and by implication essential to disciplinary thinking: "*we're using it so many times in economics*" (opportunity cost); "*in eco's it's graphs, graphs*"; "*it was a concept that was in almost everything*" (the margin); "*elasticity seems to be everywhere*". They became aware that their previous conceptions or practices did not amount to real understanding — "*I didn't really grasp what it meant until this year*" (opportunity cost); "*it was the concept that I didn't get to understand at all*" (elasticity) — and acknowledged that they had relied on surface approaches such as memorizing algorithmic ways of answering problem questions: "*if it says 'margin', this is what you must do and your graph must look like that*". These comments substantiate concerns about the quality of learning in economics noted in Chapter 2 (Davies & Mangan, 2007a; Green et al., 2013; Green et al., 2015;), and the idea that students can survive assessment by relying on an "imitation" of the discipline (Ramsden, 2003). From a TCF perspective, they may be interpreted as evidence of troublesomeness, stuckness, strategic mimicry — and thresholds not yet crossed.

Participants described how mastery of these concepts enabled or transformed understanding of many other economic ideas to which they were fundamental (section 7.2.1.7): "*all those concepts or principles … were suddenly making sense*" (opportunity cost); "*it makes so much sense now — I get more things now*" (the margin); "*this is the concept that I can relate to other concepts … you have to befriend [elasticity] so that your understanding of certain theories or concepts can be made easy*". Concepts were no longer seen in isolation — participants offered many examples of interconnections they now perceived clearly, for instance linking elasticity to profit maximization,

market power and price discrimination, and marginal benefit to the demand curve. This revealed a changed perspective on and deeper understanding of those concepts, in a type of conceptual integration that Davies (2012, p. 252) describes as "component reconfiguration". Integration — the idea that understanding a threshold concept "exposes the hidden interrelatedness of something" (Meyer & Land, 2006, p. 7) — is suggested by a participant's description of how "*it would just click, like a window breaking in my head, like ok, wait, I've seen this all my life*" (in this case, his coming to understand elasticity in relation to market power and price discrimination) (section 7.2.1.7). Participants described how understanding of these critical ideas could become internalized and automatic, to the extent that it might appear obvious — "*I can't even actually identify the way in which I looked at it [before]*" (elasticity) — and would most probably be irreversible (Meyer & Land, 2006).

Graphical analysis was singled out by many participants as a key to overall understanding — a crucial and pervasive technique that was often highly troublesome (see section 9.2.4). Once mastered, it could provide a clearer view and a powerful alternative way of expressing economic ideas, and was widely transferable to other economic problems or contexts. Although economic modelling features in the web of threshold concepts suggested by Davies and Mangan (2007a), and most of the tutorial tasks required some graphical analysis, this procedural or modelling threshold has not been deeply explored from a TCF perspective: as noted in Chapter 3, most empirical studies on threshold concepts in economics have focused on opportunity cost and elasticity. Possible reasons that students found graphs troublesome centred on issues of abstraction, discussed in the previous finding. The ensuing view that mastery of graphical analysis is a powerful enabler of disciplinary progress — a "procedural threshold" (Davies & Mangan, 2007a) — accords with other studies in economics education, which have established a link between understanding of graphs, and understanding and performance in economics (Benedict & Hoag, 2012; Cohn et al., 2004; Strober & Cook, 1992).

Overall, participants' descriptions of coming to understand particular economic concepts or techniques closely match those indicated in threshold concepts-oriented scholarship generally, and specifically in the work of Davies and Mangan (2006a, 2007a, 2008) in economics. The concepts participants emphasized were "procedural"

and "discipline" concepts (Davies & Mangan, 2007a, 2010), both types considered threshold because of their integrative, transformative effects. Many participants also conveyed a more aggregated kind of breakthrough: together, the microeconomic concepts they had learnt gave them an "*economic point of view*" (section 7.2.1.7), a new way of seeing the world and interpreting behaviour. Seeing the world through this 'economic gaze' could be personally transformative; using images of dust settling, fog lifting, or jigsaw pieces coming into place, participants conveyed their sense of having developed a changed, clear and coherent perspective on real events that they could apply confidently. Students pointed to the transferability of what they had learnt, across economics courses and in interpreting real-world events. This suggests "theoretical reframing" (Davies, 2012) whereby understanding of discrete concepts can be transferred to a more complex and broader situation, giving rise to an emerging structure of understanding that characterizes a way of thinking within a domain (Davies & Mangan, 2008, 2010).

This coherent and distinct disciplinary perspective based on an overarching conceptual structure is recognizable as the core of the Economic Thinking affinity defined by participants. The meanings they assigned to Economic Thinking correspond to ideas in the TCF and the theories on which it draws. Attaining and internalizing Economic Thinking entails reconstituting one's "meaning frame" (Schwartzman 2010, in turn drawing on the work of Mezirow) — the frame of reference through which one filters and interprets experience, comprising one's "habits of mind", and their expression as "points of view" (Mezirow, 2000). This process may also be characterized as internalizing disciplinary WTP (McCune & Hounsell, 2005) — a notion closely aligned with the TCF in its emphasis on disciplinary structures and epistemes (Cousin, 2008; Perkins, 2006). WTP may define a disciplinary "tribe" or "community of practice" (Lave & Wenger, 1991; Reimann et al., 2005), and their mastery is relevant to the emergence of disciplinary identity (Davies, 2006). In reflecting on Economic Thinking, participants also alluded to a shifting sense of self within the discipline, which resonates with the latter point and is returned to in the findings in sections 9.2.9 and 9.2.10.

The importance of developing conceptual structures or schemata for attaining disciplinary mastery has been noted in research on learning in economics beyond TCF-linked scholarship (Dubas & Toledo, 2016; Green et al., 2013), which draws on broad

cognitive views of learning. These views highlight the distinction between the thinking of (disciplinary) experts, and that of novices. The former have been shown to use cognitive structures organized around key disciplinary ideas, which guide how they experience and understand problems. These conceptual structures enable them to recognize meaningful patterns of information more readily than novices (Bransford et al., 2000) — a phenomenon noted by Davies and Mangan (2007a) in their comparison of staff and student responses to economic problems. Participants' reflections suggest they made progress towards developing these disciplinary conceptual structures as they reached understanding, and that this facilitated recall: "*I can unpack it and get to whatever it is that I need to do … you don't take that much of time writing, 'cause things are just flowing … just given a scenario you can quickly get the gist of saying, ok ok ok, this is what needs to be done*" (section 7.2.1.2). Such automatic and fluent retrieval of knowledge marks expert thinking (Bransford et al., 2000); as one student remarked with regard to Economic Thinking, "*it's just in me now*" (section 7.3.1.5) — suggesting that disciplinary WTP had become part of the reformulated conceptual structure by which she made sense of the world. While static comparisons of expert and novice thinking typically compare knowledge states "without providing a view of transition from one state to another" (Davies, 2012, p. 254), findings from this study may extend our understanding of some of the processes that can foster the reorganization of conceptual structure around threshold concepts (findings in sections 9.2.1–9.2.4 above).

Participants linked Economic Thinking to mastery of the disciplinary discourse (section 7.3.1.4) — the language through which their economic understanding and "points of view" (Mezirow, 2000) might be expressed. While Davies and Mangan (2010) caution that students may use economic terminology before having attained the level of understanding that this use of language might suggest, participants in the current study seemed to regard their confident use of economic language as a marker of having internalized economic thinking. This does not rule out the likelihood of mimicry en route to mastery, but may indicate that they are able to recognize when their competence in the language signals that they have reached authentic understanding. Participants further related the use of "*economic language*" to sharing a disciplinary understanding with fellow group members, perhaps also suggesting that increasing fluency in the discourse reflects or enables a shift to disciplinary insider status, or a

move from peripheral to full participation in a community of practice (Lave & Wenger, 1991), discussed further in section 9.2.10 below.

Synthesis (9.2.1–9.2.5): Cognitive and metacognitive shifts

Overall, the conceptual transformation associated with crossing learning thresholds is an aspect of the TCF that is well documented in existing research, including TC studies in economics. While much of the discussion under this finding is confirmatory, this study offers substantiation of the TCF perspective in a context where relatively little is known about the qualitative nature of learning. Further, this study extends understanding of possible ways in which students' crossing of learning thresholds may be facilitated or accelerated through group processes that support cognitive and affective aspects of liminal learning transitions (the latter considered more fully in subsequent findings). Collaborative learning processes of peer discussion and articulation (section 9.2.1), and scaffolded applications that brought about meaningful conceptualizations (section 9.2.4), seemed to promote transformative conceptual understanding and the development of an economic gaze on real-world events. These processes were underpinned by students' sense of capability and deeper approaches to learning, in turn fostered by the pedagogical approach (sections 9.2.3 and 9.2.2).

B. CONATIVE AND AFFECTIVE RESPONSES AND IDENTITY SHIFTS

9.2.6 Guiding the way: Goals as a nexus of disciplinary learning

Students' goals, however defined, shape the course and consequences of learning. Goals based on autonomous choice of a self-relevant discipline can motivate and sustain a deeper approach to learning.

Of all the affinities, participants ascribed the most widely varied range of meanings to Goals, which reflected the variation in their purpose or motivation in taking Econ 202 and in participating in the tutorial programme for this study (sections 8.2.1.1–8.2.1.4).

Some had little to say about their goals, or described them in narrow, achievement-oriented terms: to pass the module in order to proceed with their degrees. For others, goals centred on an intrinsic desire to improve their understanding of economic issues. Other interpretations reflected a longer term view of goals that encompassed future study and career plans, within which economics might feature to a greater or lesser extent. However reflectively or broadly students construed their goals, the meaning this affinity held for them seemed to play a significant role in mediating their learning of economics.

Participants' descriptions offer further insight into this pivotal part of their learning. Their reflections describe how having understanding-oriented or longer term goals — and associated attitudes towards their economics studies — steered and fuelled their Learning Journey, providing motivation to persist in the face of challenges: "My goals drive my journey. They drive the path I want to take in learning economics, how I tackle challenges and move on in my journey" (section 8.2.2.1). Such goals also provided the "*enthusiasm and aim*" that favoured the emergence of positive Personal Outcomes such as self-development, deeper knowledge and clarity about future plans (section 8.2.2.2). Clear but utilitarian goals centred on passing the module seemed to be associated with narrower Personal Outcomes (section 8.3.1.5). On the shadow side, students with vague or no articulated goals, who did not have much to say about this affinity, would probably not experience these vectors to the same extent: non-existent or weakly formed goals would provide neither the direction nor the impetus to sustain their efforts at learning.

Within economics, a limited amount of work has pointed to the role of students' motivation and interest as a determinant of performance (Arnold & Rowaan, 2014; Denny, 2014; Owen, 2012; Van der Merwe, 2006, 2007). Arguably, issues of students' goals and motivation transcend discipline-specific education research. Although threshold concepts scholarship generally seems not to have focused on goals or motivation explicitly as an essential component of the framework, the study findings may be readily mapped on to a TCF view of learning, in that students' goals may be seen to overarch and guide the liminal transition learning requires of them. Goals (as understood from participants' descriptions) determine students' approaches to learning, and thus the extent to which they will engage and grapple with troublesome threshold

concepts. Akin to the "will to authenticity", these overarching goals are significant in determining whether students attain reflective learning, or remain defensive (Schwartzman, 2010); goals may be pivotal to whether students' responses to learning challenges are to "fight" (to learn) or "flee" (Berg et al., 2016). Goals as participants conceptualized them — as steering and fuelling their learning journeys — appear to be inseparable from, or even synonymous with, motivation (section 8.2.2.1). Noting the Latin origins of "motivation" in *movere* (to move), Pintrich (2003) extends the suggestion that their goals may help to move students through the learning transition. Closely interwoven with motivation, and also critical to students' progress through the liminal phases of their learning, are the self-related variables or volitional factors discussed more specifically in the next finding (section 9.2.7).

Taking a wider theoretical perspective, both motivational and volitional aspects of learning have been extensively explored in scholarship around motivation and self-regulated learning. The conceptions of goals that participants described in sections 8.2.1.1 and 8.2.1.2 — "*Just to pass*" and "*I just wanted to understand more*" — correspond closely to the "performance" and "mastery" (or "learning") goal-orientations commonly identified in this body of research (Pintrich, 2003; Valle et al., 2003; Zimmerman & Schunk, 2008). Mastery goals orient students towards learning, understanding, and developing their abilities with respect to self-referenced standards — in short, towards increasing personal competence. Having mastery goals is associated with positive cognitive, motivational, affective and behavioural outcomes. Performance goals, by contrast, emphasize demonstrating abilities, receiving recognition, and protecting one's self-worth. Performance goals orient students to seek positive judgements of competence based on comparative standards, and are associated with less adaptive outcomes (Pintrich, 2003; Zimmerman & Schunk, 2008). Aiming "just to pass" as some participants reported would seem to target the lower end of the performance spectrum.

As might be expected, students with strong mastery (or learning) goal-orientations have been found to make greater use of deep approaches to learning (Dweck & Master, 2008), which require some effort and enhance understanding, while performance goal-orientation is associated with the use of superficial learning strategies such as memorization (Valle et al., 2003). This distinction might also be couched in terms of

student engagement: those with a learning goal-orientation show higher levels of cognitive investment in, active participation in, and emotional commitment to their learning (Zepke, 2013) — an idea that returns us to threshold concept learning, since variation in the depth of student engagement has been suggested as an important reason for variation in students' understanding of threshold concepts (Zepke, 2013).

The potential significance of students' construals of goals to their learning leads us to consider what factors might influence these plans and intentions. Participants' descriptions in Chapter 8 suggest that their conceptions of goals are complex, malleable and dynamic. They evolve over the course of learning, and are influenced by feelings arising from students' learning experiences and from their beliefs about themselves in relation to learning. Chapters 6 and 7 suggest that collaborative disciplinary learning processes may contribute directly to participants' goal development by enhancing their sense of self-efficacy in economics (as discussed in section 9.2.3), motivating a desire for understanding (section 9.2.2), or revealing economic thinking as a useful tool worth striving to attain (section 9.2.4). Some students might even use the disciplinary perspective as a philosophical tool in setting their personal goals. Chapter 8 revealed that participants' goals were further influenced by increasing enthusiasm for economics, feeling that the discipline was congruent with one's self-concept and values, and a sense of sureness about one's personal abilities to persevere and overcome challenges, as encapsulated in these extracts from section 8.4.2.1: "*My love for economics has grown that I even want to become an economist … If I feel that economic thinking, which has led me to my goals, will affect others positively, then I will feel better about what I'm doing … it will just make me want to learn more … If you truly have some love for something … then you can conquer anything. Economics is tough but I will major in it. I always feel like a person who can always achieve his goals.*"

Many of these factors coincide with widely accepted, empirically supported claims about the determinants of student motivation, distilled from a multitude of models by Pintrich (2003) as: self-efficacy and competence beliefs; attributions and control beliefs; levels of interest and intrinsic motivation; levels of value (the extent to which students find learning relevant and useful); and goal content and orientation. Many of these aspects are clearly interrelated or reciprocal, and in particular the first four sets of factors have also been identified as determinants of goal orientation (Valle et al., 2003).

Situational and contextual variables, including type of content to be learnt, task features, teaching style and assessment criteria, also influence students' learning goal orientation (Valle et al., 2003), with implications for teaching.

Some of these factors may be briefly elaborated with regard to the findings of this study. The role of pedagogy and peers in building self-efficacy and competence beliefs has been discussed in section 9.2.3. In a potentially self-reinforcing process, increasing self-efficacy can motivate continued efforts and greater competence (Schunk, 1991), fostering a mastery goal-orientation. It is also possible that the level of comfort and solidarity participants experienced among peers in the tutorials encouraged them to shift from performance to mastery orientation, as they could focus on learning and their participation was not held back by the fear of being judged for a lack of competence (Bransford et al., 2000). The conducive features of the tutorial content and format have been noted in section 9.2.4, and the levels of interest and value they appeared to hold for participants are reinforced in this and subsequent sections.

Attributions and control beliefs are integral to the idea of the capable self suggested in section 9.2.3, and students' views of themselves as agents of their own learning. From a motivational and self-regulated learning perspective, existing scholarship suggests a further insight in its linking of students' goal orientation to their "self-theories", "mindsets" or views of their own intelligence (Dweck & Master, 2008). Broadly, students who hold an "entity" view (or "fixed mindset") regard intelligence as largely fixed and beyond their scope of influence or control, while those who have an "incremental" theory (or "growth mindset") believe their intelligence is pliable and may be increased through their own efforts. Self-theories "can shape students' goals and values, change the meaning of failure, and guide responses to difficulty"; students with an incremental view will be more likely to take charge of and persist in their learning efforts (Dweck & Master, 2008, p.32). It seems likely that an incremental self-theory, with its accommodation of growth and change, would support and enable the transformations induced by threshold concept learning. Such views of increasable intelligence (Valle et al., 2003) and the associated sense of control over one's learning are implicit not only in the goals of those who said they wanted to understand more (section 8.2.1.2), but also in some of the Personal Outcomes students related: "*I have*

grown studying. I've developed. 'Cause I've learnt a lot ... I developed in my academic world" (in section 8.3.1.1).

Another important influence suggested by participants' conceptualizations of their goals was the question of autonomy or freedom of choice in their studies. Participants who felt that it was their choice to study economics generally expressed a deeper and more conscious understanding of what goals meant to them. The sense that this was a choice they had made freely was a motivating factor, and was associated with a desire to understand — a mastery orientation that fostered a deeper approach to learning. This aligns with self-determination theory (Ryan & Deci, 2000), which sees autonomy as an innate human psychological need, manifested in a learning context by a natural inclination towards activities that are experienced as self-chosen. The conjunction of personal interest, autonomy and self-determination is exemplified by intrinsically motivated learning (Pintrich, 2003), where students undertake the activity for the interest, enjoyment and satisfaction derived from the task in itself.

Feeling that it was their choice to study economics depended in turn on participants' seeing the value or use of the disciplinary knowledge they gained — in other words, finding it meaningful (as related in section 9.2.4). While this might be more obviously the case for economics majors and those doing Econ 202 as an elective, who would have consciously chosen this course of study, it appeared to be just as true for those for whom Econ 202 was a compulsory course required by their BCom or BCom (Accounting) degree. Among these, there seemed to be a split between those who saw economics as largely irrelevant to themselves and thus experienced its inclusion as a compulsory module as an imposition, and those who felt it was worthwhile and interesting, even though it was not their intended major.

The former "*take it to second year and then they think they're going to leave it. It's just part of B.Com. requirements so they just want to get it over and done with. So they don't see the value of doing economics*" (section 8.2.1.1). By contrast, the latter group is exemplified in section 8.2.1.2 by: "*I'm not majoring in economics, just trying to understand it better ... I have developed an interest in economics, why people behave the way they do ... So when I got a chance to do economics, it now started to be part of my goals ... it seems like quite an interesting module to understand because ... it lives around us*". While the module may have been a prescribed part of their degree

curricula, its content aligned with their interests; they saw its relevance to themselves in the world or to their career plans, so at some level were able to feel this was a choice they had made for themselves.

The levels of interest and perceived value that participants conveyed align with the idea of achievement value as a motivator (Pintrich, 2003) consisting of four elements: importance (of doing well on a task, or with regard to a task's identity-relevance); intrinsic value (or enjoyment); utility value (or usefulness); and cost of undertaking the task (Wigfield, Hoa & Klauda, 2008). Interestingly, this model resonates with an economic worldview in its suggestion of weighing benefits and costs. High levels of value can be seen to match the perceptions of the more engaged, mastery-oriented students quoted in the previous paragraph. Equally, perceptions of low value may explain the stance of the performance-oriented participants who aimed "just to pass", one of whom elucidated: "*And for the exams I'll calculate my class mark and I'll say ok, at the exam I should work this hard. So the goals — it goes back to the economic thinking, like trade-offs, opportunity cost — for me to achieve I have to give up my leisure time, see?*" (section 8.2.1.1) — ironically using economic reasoning to justify her allocation of as little time and effort as feasible to studying the discipline. While this stance may be unpalatable for educators, it is helpful to view goal adoption as a dynamic and situated response, rather than a fixed personal characteristic (Pintrich, 2003). Thus minimizing effort (cost) in pursuit of a pass in a discipline which one does not experience as personally important, relevant or useful could also be recognized (particularly by teachers of economics) as a rational response. The implications of this will be considered in Chapter 10.

For students who experienced their learning in economics as having high value, exercising autonomous and conscious choice in light of an appreciation of disciplinary meaningfulness or relevance might extend to developing longer term study and career plans, as described by several participants in section 8.2.1.4 — "*This is the thing that I want to do*". For these students, their choice impacted especially strongly on their sense of themselves, as it also fostered an emergent professional identity, a view of themselves as future economists (returned to in section 9.2.10). But whether or not their perceptions of the discipline as meaningful and self-chosen led them to include it in future plans, it seems that students' motivation to understand, reflecting a mastery

orientation and an associated deep approach to learning, was linked to a sense of their own agency: they chose to study economics freely, found it interesting in itself, and saw themselves gaining relevant, applicable knowledge that empowered them — "*opening my eyes to how the world works*" (section 8.3.1.5). In other words, the discipline as they experienced it in their learning was congruent with their own identities.

Perceiving themselves as autonomous agents who had chosen to study a discipline they experienced as relevant and meaningful appeared to give rise to a conscious commitment to particular goals (relating to the pursuit of understanding per se, or to further study and career aspirations). Commitment to goals in turn served to steer and fuel participants' Learning Journeys, by guiding subsequent study-related decisions. Many of their descriptions allude to the role of goals in feeding their perseverance when encountering difficulty in the discipline: "*[My] goals have helped me to carry on [with] eco's because there is a lot of new stuff to learn and grasp. It has helped me to not easily give up on some aspects of economics because it could be a difficult module that is very challenging, so me having interest has given me that motivation to pursue it even if it is giving me a hard time ...*" (section 8.2.2.1). In short, having this type of commitment to broadly construed disciplinary learning goals can favour a "fight" rather than "flee" response in the face of difficulty. This points to the need to contemplate how full, mastery-oriented, long-term conceptions of goals in relation to students' learning of economics might be fostered. The idea of commitment recurs in the next finding.

9.2.7 Staying the course: Conative and affective constructs

Moving forward in one's learning entails consciously staying the course, choosing to fight rather than flee in the face of cognitive challenges and affective demands; learners' psychological resources will influence their persistence and progress.

Learning economic concepts — progressing through the Learning Journey to reach Economic Thinking — was not an automatic process for participants: because conceptual learning could require repeated attempts, practice, and time, making this transition might demand great personal effort and perseverance. The previous finding highlighted the role of conducive goals in providing the motivation to steer and fuel students through challenging learning transitions. Further contemplation of students'

reflections suggests that consciously staying the course also seems to require particular traits or psychological constructs that operate at a deeper level of the self and interact with the motivation provided by having defined goals. The split between the findings in sections 9.2.6 and 9.2.7 is based more on convenience than substance. Loosely, the previous finding was about students forming and committing to goals; this one centres on how they may go about pursuing or realizing those goals (which is of course inseparable from the ways in which those goals have been conceptualized).

Participants referred to determination and hard work in reflecting on their journeys to understanding (section 7.2.2.1). Their descriptions of moving through stuckness by seeking out alternative explanations of difficult material, and their reflections on their own learning practices and study habits (sections 7.2.1.6, 7.2.1.8 and 7.2.1.9), show the importance of initiative, conscious effort, and self-regulated learning strategies. Those who felt they were coping and progressing in their learning expressed a sense of agency and self-efficacy; they faced challenges with self-belief and a plan, and attributed good performance to their own efforts and study approaches (sections 7.2.1.8 and 7.2.1.9). On the other hand, some participants alluded to deeper problems around their own motivation, procrastination and underperformance (section 7.2.1.8).

A shift in students' conceptions of learning to emphasize understanding constructed in the light of 'knowing why' (section 9.2.2 above) made metacognitive and affective demands on them. This view of learning brought the probability that they would have to deal with uncertainty and incomplete understanding en route to mastery. They might not grasp concepts and theories immediately, could be forced to question what they thought they knew, and would have to tolerate and trust the process (section 7.2.1.4). Students might face additional affective discomfort as a result of deeper engagement with content that raised existential or moral questions for them (section 7.3.2.3).

Recognition of these challenges around disciplinary learning is one of the cornerstones of the TCF; it is these difficulties and demands that inform the view of learning as a transformative transition through a liminal space. Nonetheless, TC scholars acknowledge that this liminal traverse is one of the less well understood aspects of learning (Land, 2013; Rattray, 2016). Participants' descriptions point to particular traits, attitudes and/or behaviours that impacted on how they negotiated liminality, and these may serve to extend our understanding of students' progress through this transition.

Broadly, these factors may be described as conative and affective constructs. Both motivation and volition are considered part of conation (Snow & Jackson, 1993) — the third component of mind historically identified in psychology (cognition and affection being the other two psychological domains[35]). Conation can be described as "the mental process that activates and/or directs behaviour and action" (Huitt & Cain, 2005, p. 1), and has been characterized as a "commitment pathway" from intent to action (Snow & Jackson, 1993). It is a useful term here because it encompasses motivation and volition, which are interlaced and not always separable, and accommodates a plethora of conceptually overlapping psychological constructs relevant to learning. In addition to the motivational and metacognitive factors discussed in the previous finding, conation includes will, effort, perseverance, self-direction and self-regulation (Huitt & Cain, 2005). Students' descriptions suggest that these conative constructs were significant influences on the course of their learning. Furthermore, they were closely associated with affective constructs — elements of personality, attitudes or predispositions that could favour or hinder their learning.

In the ambit of the Learning Journey, Economic Thinking (Chapter 7) and Goals (Chapter 8), which together were portrayed as the Head loop linking (primarily) cognitive and metacognitive aspects of their learning, students' reflections point to constructs that closely match the main sets of influences on student motivation established in educational psychology. To recap from section 9.2.6, these are summed up as students' self-efficacy and competence beliefs; attribution and control beliefs; interest and intrinsic motivation; value; and goals (Pintrich, 2003; Valle et al., 2003). These overlap substantially with the notion of metalearning (Biggs, 1985; Ward & Meyer, 2010) — defined as comprising awareness and control over oneself as learner, and as such drawing constructs from cognate theories of attribution, locus of control and self-regulation (Meyer, 2010). Metalearning capacity is knitted into the TCF as a determinant of students' engagement with threshold concepts, and a potential area of intervention to enhance learning (Meyer, 2010). The implications of the significance of these constructs — in theory and as suggested by participants' descriptions — will be considered in Chapter 10.

[35] However, the boundaries among the domains are "fuzzy", and largely a matter of emphasis, since all human behaviour entails a mixture of all three aspects (Snow & Jackson, 1993).

Further pertinent personal constructs are indicated by the affective, metacognitive and conative features of learning that recur in the descriptions of outcome affinities in Chapter 8. Here, Goals, Personal Outcomes and Feelings constituted the Heart loop, depicting the affective and identity-centred components of participants' learning. Students' reflections convey a recognition that how they managed their feelings was important in shaping the trajectory of their learning: "*[W]hen I reach my goal I'm happy, but now it's important to feel the same when you're trying to reach your goal … I can maximize my happiness by being happy by accomplishing the sub-goals, [rather] than the bigger, which might lead to disappointment if not accomplished … I didn't dwell on failing ... I was forward thinking … that I might do better in the exam or other tests*" (section 8.4.2.1). By the same token, overwhelming emotional responses to stuckness and assessment (sections 7.2.1.5 and 7.2.1.9) might derail students who could not access psychic resources (internal or external) to stay the course. Progress in learning required students to maintain stable affect, stay optimistic in the face of challenges, identify and work towards achievable objectives, and show resilience in recovering from setbacks. As summed up by a participant, "*It has been a struggle that has not yet ended but I will not give up on my studying toward economics*" (section 8.4.2.1). Implicit in all of these descriptions is a sense that these students took ownership of and responsibility for their learning — their successes and failures, and their affective responses.

Personal traits and attitudes suggested by participants' reflections as influencing the extent to which they persisted in the face of difficulty include fortitude, determination, and resilience; self-beliefs including (but not limited to) a sense of self-efficacy with regard to the discipline; self-awareness, including metacognitive insights; an ability to manage one's emotions and retain an optimistic outlook; agency and taking ownership of one's learning; and academic commitment. It would seem to be due to the nature of the field of psychology that many of these constructs are closely associated or near-synonyms; some overlap with those mentioned earlier in this and the previous section, and the line between conative and affective dimensions appears increasingly blurred. Notwithstanding, these constructs are useful as they signify the means by which considered goals, reflecting a sense of congruence between discipline and identity, may be translated into decisions and behaviour that advance students' learning. Returning momentarily to the SID, the graphic representation of these personal constructs lies in

the vector from Feelings through Goals to the Learning Journey. This is also the feedback link that completes the system of students' learning and makes it (potentially) self-reinforcing.

All of these constructs are drawn from positive psychology, which represents a shift away from the study of pathology and weakness, towards that of human strengths and assets (Human-Vogel & Van Petegem, 2008). With regard to learning, positive psychology has thus far paid more attention to cognitive processes for goal attainment than to the role of positive emotions (Human-Vogel & Van Petegem, 2008; Rattray, 2016). Findings from the current study resonate with emergent knowledge about how positive psychological constructs impact on learning behaviour. Importantly, although they are framed as positive constructs and the aim is not to pathologize, these influences may also be significant by their absence — in theory, and in participants' experiences. With regard to the latter, although the data is dominated by the positively couched descriptions of those who reflected on the clear progress they felt they were making, there were also some students who identified problems in their own procrastination and lack of persistence (section 7.2.1.8), and some who remained stuck on particular concepts or with economics generally (section 7.2.1.5). Viewing students' navigation of liminality in terms of these constructs may therefore also help to identify where things might go wrong for some learners, and how the higher education environment might foster the development of personal psychological resources that favour persistence. Two areas are elaborated here: academic commitment and psychological capital.

Academic commitment has been characterized as a self-regulatory process used to maintain a sense of self that is coherent with one's behavioural choices in a learning environment (Human-Vogel, 2008). This conception of "commitment" is future-oriented and intentional; it reflects a tendency to embrace learning actively, and involves accessing positive emotions for self-regulation. The idea of "compliance", by contrast, refers to a tendency merely to cope with the stress of learning (Human-Vogel, 2008). From this perspective, commitment is not to an external goal, but to a sense of self or an identity — one's "future self-construal" (Human-Vogel, 2013, p. 533). Because it implicates self-understanding and identity, commitment does not subsist solely in intention: it requires congruence among goals, identity and behaviour (Human-Vogel, 2013). Self-investment is argued to be the essential feature that distinguishes

commitment from compliance, and has been linked to a learner's sense of self-efficacy, and the personal meaningfulness of the learning task (Vogel & Human-Vogel, 2016). Considering participants' conceptions of goals (discussed in the previous finding) from a commitment perspective supports the idea that students who had a low sense of self-efficacy in the discipline, and did not perceive it as personally meaningful or relevant to themselves or their career plans, were likely to invest less time and effort in their studies, affecting overall commitment and achievement. The importance of congruence among identity, learning goals and behaviour also raises broader concerns about the number of participants who had entered their studies without well-considered plans and subsequently changed course (section 8.2.1.4). Both of these issues will be revisited in Chapter 10, while identity-linked aspects of disciplinary learning — a central element of the TCF — recur through the findings in sections 9.2.9 and 9.2.10 below.

The positive psychological constructs highlighted by the study findings strongly complement recent exploration within threshold concepts scholarship of the impact of psychological characteristics on how learners cope with liminality (Rattray, 2016). The composite construct of positive psychological capital, or "PsyCap", consists of four constructs — hope, self-efficacy, optimism, and resilience — that have been found to exert a cumulative influence on human behaviour (Luthans & Youssef, 2004, cited in Rattray, 2016). The PsyCap construct originates in management and organizational psychology, and has not been extensively tested in education. From a TCF perspective, Rattray hypothesizes that learners who believe themselves capable (self-efficacy), attribute success to their own efforts (optimism), monitor and align goals and the pathways to reaching them (optimism), and persist in the face of difficulties (resilience) may cope more effectively with liminal learning transitions; students who lack these affective assets may, despite having intellectual capacity, remain stuck.

This seems an accurate characterization of the attitudes and traits reported by participants who regarded themselves as making progress in their learning in economics (sections 8.4.2.1 and 7.2.1.8). Although this study did not set out to measure psychological constructs, the findings offer some early substantiation and illustration of the impacts posited by Rattray (2016). Participants' reflections on their Learning Journey recorded in Chapter 7 also align with the suggestion that PsyCap is associated with "a willingness to engage and take ownership of the learning and with awareness

that learning does not simply happen but, rather, it requires effort and agency" (Rattray, 2016, p. 73).

Two additional positive psychological constructs are worth highlighting here: "fortitude", and "grit". Fortitude (Strümpfer, 1995) refers to psychological strength, and is expected to result in psychological coping, emotional stability, and stress tolerance (Hamid & Singaram, 2016). Grit (Duckworth, Peterson, Matthews & Kelly, 2007) has been defined as "perseverance and passion for long term goals" (2007, p. 1087). Grit has been found to have high predictive validity for long-term retention (or persistence) in various academic and workplace contexts, and is also potentially able to explain why intelligence may not always translate into achievement (Duckworth et al., 2007). Both grit and fortitude are similar[36] to PsyCap and its components, and also appear to match participants' characterizations of their psychological approaches. I have emphasized PsyCap not only because of incipient TCF work exploring that construct, but also because the metaphor of psychological capital suggests that this is a resource that may be developed or accumulated. Its utility is therefore not only explanatory, but also rests in its being a potential area for interventions to support learning (Rattray, 2016) — an implication that will be returned to in Chapter 10.

9.2.8 Affecting learning: Pervasive and influential emotions

A spectrum of affective responses can arise from, and in turn impact on, all aspects of learning.

Learning is an emotional process, and feelings — positive and negative — seemed to permeate every aspect of participants' experiences of learning economics in lectures and on the tutorial programme. These emotions[37] arose from processes of learning and engaging with the disciplinary content, from assessment, or from the learning environment; they seemed to circulate and intersect in complex ways to influence

[36] Perhaps because positive psychology is a relatively new field (Seligman & Csikszentmihalyi, 2000), it would seem to house many near-synonymous constructs.
[37] I use the terms "affect" and "emotion" synonymously with the "feeling" component of learning, while acknowledging that in the relatively new field of educational emotion research, the terminology may be contested (Jackson, 2015).

students' learning, and may therefore also be detected as affective undercurrents in many of the other findings reported in this chapter.

Students felt apprehensive and anxious encountering new content, which was heightened in a context of lecture-based delivery and assessment by class tests (section 8.4.1.1). The experience of stuckness and struggling to understand and internalize content on one's own was frustrating and demotivating for many, as described in Chapter 7. Assessments caused extreme anxiety for some (section 8.4.1.3); poor performance on assessments could be disappointing and demoralizing, while achieving good grades brought a sense of accomplishment and increased motivation (section 8.4.1.4). Perhaps more surprisingly, there was also emotion linked to the content itself. Students described their joy and pride in mastery of concepts and theory (section 8.4.2.2); the fun, "*adventures*" and sense of discovery of thinking like an economist (section 8.4.1.5); the sadness of reaching a full understanding of opportunity cost, which required them to relinquish old views of limitless resources or opportunities; and the cognitive dissonance that might arise if they perceived the disciplinary emphasis on self-interest as conflicting with their own values (section 7.3.2.3). Participants described a raft of positive emotions associated with the tutorial format and Group Dynamics. As described in Chapter 6, these included feelings of comfort, security and belonging to a group with shared interests, experiences and perspectives; feeling recognized and valued within the group (section 8.4.1.7); and having fun while engaged in learning (section 8.4.1.5). Participants also conveyed increasingly positive feelings about economics (section 8.4.1.4), which they linked to reaching a greater understanding of the discipline and its applicability.

Economics education research in general barely touches on affective aspects of learning (with a few exceptions that will be noted shortly). However, the threshold concepts perspective considers the affective elements of learning to be inseparable from the cognitive. In the TCF, the main sources of emotion seem to be the liminal nature of conceptual learning, and the potential implications of transformed understanding for learners' sense of self (Cousin, 2006; Meyer & Land, 2006; Timmermans, 2010). These elements are evident within the sweep of participants' affective responses sketched in the preceding paragraphs. The experience of stuckness, incomplete understanding and questioning one's knowledge, as well as the psychic demands this made on participants,

the importance of how they responded, and whether they had the personal resources to cope with liminality, are reflected in the data chapters and discussed in several earlier findings, notably in section 9.2.7. Issues around participants' emerging sense of themselves in the discipline are considered further in sections 9.2.9 and 9.2.10.

The emotions that attached to the transformative aspects of learning might at times appear almost heroic in nature; the unease around liminality and transformation is recognized as a necessary part of learning in the TCF, and is akin to "adaptive anxiety", which reflects the emotional investment needed for intellectual growth (Shulman, 2005). Participants recognized that negative or difficult emotions could be useful and necessary to their learning: "*Sometimes you learn something when you get a bad situation. You learn more and then you know what to do, now I need to change my techniques. And then that makes us to grow, to learn and to change stuff*" (section 8.4.2.1). This reinforces the argument that the intention in pedagogy should be to support students to manage and learn from difficult or painful emotions associated with learning, rather than trying to eliminate them.

However, in addition to this developmental and constructive affect, participants described a more general, low-grade, 'routine' type of anxiety that was linked to feelings of intellectual inferiority and self-doubt (noted in the finding in section 9.2.3), to the pressure to absorb lectured content, and to the prospect of assessment. This type of unconstructive and potentially debilitating anxiety related to pedagogy and assessment may be helpfully reduced.

Considering students' emotional responses may add a dimension to our understanding of concerns about the conceptions of knowledge and approaches to learning fostered by lecture-dominated delivery (as discussed in Chapter 2, and supported by the findings in sections 9.2.2 and 9.2.3 above). The pressure students felt to internalize (and store for subsequent retrieval) the volume of 'truth' dispensed at a rapid pace in lectures appeared to be a source of anxiety in itself. This was directly addressed by the ways in which the group was empowered and entrusted to build understanding in the tutorial programme, helping participants to conceive of themselves as capable and in control of their own learning, as discussed in section 9.2.3.

Anxiety and self-doubt associated with learning have received little attention in research on economics education, despite the likelihood that these feelings would be associated with a discipline many students find difficult. Benedict and Hoag (2002, p. 31) note that economics "can evoke strong emotions of fear and anxiety". They attribute this "apprehension" primarily to course reputation, and find that female students are more apprehensive, while increased mathematical ability reduces apprehension. Students' anxiety about being able to read and interpret graphs has also been linked to poorer academic performance (Cohn et al., 2004). In a local context, Tang (2011, p. 35) observes that "students often arrive with a fear of economics", postulating that this is because it is a new disciplinary field and often includes mathematics, to which many students are averse. Beyond this, the sources of anxiety related to learning economics, and the ways in which anxiety may affect students' learning behaviour, remain for the most part undocumented.

Assessment in tests or examinations was a significant cause of anxiety for many participants (section 8.4.1.3). Fear was linked to the possibility of failing (especially for those who had failed economics in the past); many also ascribed their anxiety to fear of the unknown — the unfamiliar written test format, and being unsure of how to prepare for it. Some attributed poor assessment performance in part to the extreme anxiety they had felt (section 7.2.1.9). Anxiety is the most commonly reported — and the most researched — emotion in education (Jackson, 2015). Test- or examination-related anxiety has received the most attention, and empirical work in this field strongly suggests that high levels of test anxiety generally have "a debilitating effect on attainment" (Jackson, 2015, p. 256). This impact has also been established in a recent study in economics, which found debilitating test anxiety to have a significant negative impact on students' performance (Kader, 2016) — an issue that has been largely ignored within the quantitative, 'determinants of success' tradition in economics education research, although the same relationship has been empirically established in other disciplines (Kader, 2016). Fear of academic failure may also cause some students to adopt defensive strategies, leading to disengagement and study avoidance (Jackson, 2015). In view of this, accounting for the effects of anxiety may suggest an additional interpretation of the procrastination behaviour some participants recognized (described in section 7.2.1.8 and considered with regard to motivation and self-regulation in section 9.2.7). Research on test-related anxiety to date is largely quantitative, and has

not deeply explored students' experiences in terms of the sources of their fears, how fears are perpetuated, or the effects of fears on their learning (Jackson, 2015). Arguably, the portion of assessment-related anxiety that derives from unclear expectations with regard to the details of assessment requirements is not conducive to learning and could be relatively easily mitigated in class. However, it seems likely from participants' comments that at least some assessment anxiety has deeper roots in learners' biography, in past emotions and relationships around learning and assessment contexts (Crossman, 2007) — greater understanding of which might point to ways in which the obstructive impacts of this type of anxiety on learning and assessment may be dispelled.

Although there is no comprehensive, empirically tested theory of emotion in relation to learning in the relatively new field of educational emotion research, it is accepted that emotions exert a powerful influence on thinking (Baker, Andriessen & Järvelä, 2013; Taylor, 2006). While some emotion is necessary for engagement in learning, excessive emotion can prevent clear thinking (Baker et al., 2013). In neuroscientific work, optimal learning has been described as a "safe emergency" — involving high attention without debilitating anxiety (Cozolino & Sprokay, 2006, p. 14). By contrast, a stressful learning environment, memories of failure and shame from past learning experiences, or being in the position of being evaluated can trigger stress that inhibits brain functioning and hinders learning. These views lead neuroscientific researchers to a recommendation also made within the TCF: the importance of providing emotionally supportive learning experiences and relationships, or a "holding environment" to enable learners' development (Cozolino & Sprokay, 2006; Land et al., 2006; Taylor, 2006).

Participants' accounts of emotions attaching to disciplinary content itself are surprising against the backdrop of most economics education research, from which they are absent, but they are predicted by the TCF. Particularly, the opportunity cost concept evoked a sense of sadness or loss (section 7.3.2.3), which matches the explanation offered by Shanahan and Meyer of why grasping opportunity cost may be experienced as transformative: "it fundamentally changes their way of thinking about their own choices, as well as serving as a tool to interpret the choices made by others" (2006, p. 102). Participants' phrasing suggested that theirs was an existential sadness that stemmed not from realizing the immediate opportunity cost of any given decision, but from giving up the old worldviews they had held before they 'knew' about (economic)

scarcity, and when they still believed in abundance: "*it is sad how one has to choose…*" (section 7.3.2.3). This type of sadness is developmental rather than debilitating; it is noted here not as a problem to be addressed but as an example of how content that can seem devoid of emotion (and is usually taught as such) may not be so for students.

A few participants mentioned possible tensions between narrowly defined self-interest or utility maximization as an underlying disciplinary principle, and their own more altruistic values (section 7.3.2.3). It is possible that internalizing a disciplinary perspective may create a level of cognitive dissonance, particularly if students interpret that perspective as a normative code to live by, instead of an analytical model approximating human behaviour, to make use of when they recognize appropriate circumstances (Siegfried, 2009). This suggests a need to question the extent to which the former view may be fostered by the narrow neoclassical content and lectured delivery typical of (at least) level 1 and 2 economics. While the data regarding this issue does not allow firmer conclusions, these comments may suggest that some students have a level of metacognitive awareness that enables critique of neoclassical economics — they have understood the theoretical canon, and are able to reflect on why it may not appeal to them. This possibility has not been explored deeply enough in TC-oriented studies in economics. However, it evokes some of the curriculum and content concerns reviewed in Chapter 2: that the discipline is not value-free (Docherty, 2010; Heilbroner, 1987), yet this is not usually made explicit (particularly not at undergraduate level); and that the questions typically addressed in introductory and intermediate courses may not be very relevant to students (Emami, 2005; Saunders, 2008). Those who take economics hoping to make the world a better place are likely to be disappointed, at least in their first few modules. Perceptions of disciplinary values relative to their own would impact on whether students experience the discipline as meaningful (section 9.2.4) and congruent with their own identities (section 9.2.6), and are therefore potentially an important influence on how they respond to learning and liminality. Whether the implicit disciplinary values conveyed by the curriculum (and pedagogy) typical of level 1 and 2 economics modules reduce students' interest and enthusiasm (Mendeloff, 2008) and provoke a defensive response warrants further exploration from a threshold concepts perspective.

Participants also recounted an array of positive emotions emanating from their learning experiences. Reaching understanding and recognizing their progress brought joy, relief, satisfaction and pride (section 8.4.1.2); together with a growing sense of self-efficacy in economics (section 9.2.3), these feelings motivated them to continue learning and reinforced their goals (section 9.2.6). Almost all participants commented on the "fun" element of their learning in the tutorials (section 8.4.1.5), reflecting the intrinsic motivation associated with attending the sessions (Pintrich, 2003), which may account in part for their positive responses to working on high-level, conceptually demanding academic activities in the tutorial tasks. Their experience of the tutorials as enjoyable and engaging ensured that they maintained concentration, evoking the "safe emergency" of a conducive learning environment described earlier in this section. Some participants expressed a sense of excitement, adventure and discovery in applying their emerging disciplinary skills. Although most considerations of liminality in learning emphasize uncertainty, the possible sense of loss, and the doubt and anxiety with which many meet it, it is possible that this transformative space may evoke a continuum of emotional responses, so that some learners might feel "exhilaration" where others register "terror" (Timmermans, 2010, p. 12). Whichever response prevails, awareness of the potential emotional charge of learning raises questions for teaching. In this study, it seems that the group dynamics reinforced the element of adventure and discovery that some students felt, and also offered support for those at the anxious end of the affective learning spectrum, as noted in section 9.2.3. The role of the group is discussed further in the next finding.

Many participants expressed increasingly positive feelings and attitudes towards economics, some surprisingly strong, which were linked to a recognition of their own competence and of how the discipline could be useful to them: "*I think I love it more now 'cause I understand it more ... I know more or less when I can use it. I learned how to use it better, and as I use it I love it more ... I became more enthusiastic about economics*" (section 8.4.1.6). These comments bear out the connection of disciplinary meaningfulness, engagement and self-efficacy discussed in section 9.2.4, and highlight the potential strength of affective responses and the associated intrinsic motivation (Pintrich, 2003) and academic commitment that might be elicited by disciplinary learning that is experienced as congruent with one's sense of self (Human-Vogel, 2008,

2013). Participants' emerging disciplinary identities are considered in sections 9.2.9 and 9.2.10.

The range of affective responses can in turn influence learning significantly. The feelings just described are not merely side-effects or a backdrop to the 'real' (cognitive) processes of conceptual mastery; participants' reflections suggest that emotions have a major impact on all aspects of their learning experiences and outcomes, which accords with Vygotsky's view that "affect is the alpha and the omega, the first and last link, the prologue and epilogue of all mental development" (Vygotsky, 1998, p. 227). As noted in sections 9.2.6 and 9.2.7 above, students' goals, and how they translate into actions that advance learning, are affected by their feelings about economics and how it aligns with their self-concepts, values, and future plans, and also by their feelings about themselves as learners, and their sense of self-efficacy with regard to the discipline (Feelings influence Goals, section 8.4.2.1). Yet the teaching of economics generally disregards the possibility that theoretical content, as well as pedagogy and assessment, may not be emotionally neutral for students. This raises implications that will be pursued in Chapter 10.

9.2.9 Belonging: Refuge and prospect in the peer group

The peer group can foster a sense of belonging, safety and comfort, from which students can contemplate and initiate learning transitions and personal transformations.

The sense of belonging and personal affirmation that participants felt in the group was reflected in the references many made to making friends, being like a family, and feeling at home (section 6.2.1.8) (and may have accounted in part for their reluctance to be entirely anonymized in this thesis, as noted in Chapter 4). The students valued the opportunities to socialize and get to know peers, contrasting this with the anonymity and isolation of large class lectures (section 6.2.1.7). The significance they ascribed to this aspect of their learning suggests that this sense of belonging may be missing not only from traditional mainstream lectures in economics courses, but perhaps even from campus life and their university experience in general. Their enjoyment of the group interactions and bonds on a social level increased their engagement with the programme and its conceptual content, as these were "*the people you can relate with, the people*

who can understand your language and … encourage your level of thinking and who can just bring out the best in you" (section 6.2.1.9). Belonging, being comfortable and feeling at home also meant that they felt secure and safe from the risk of judgement within the group, which encouraged them to expose their thinking and opinions without fear (sections 6.2.1.8, 6.2.2.4 and 6.2.2.5).

Within economics education, research on cooperative learning has focused on academic rather than social benefits; however, the latter are confirmed by an extensive body of empirical research (Johnson, Johnson & Smith, 2014). Beginning with the more immediate arena of disciplinary learning in the tutorial sessions, participants' descriptions of how the social aspects of the group work promoted their 'level of thinking' correspond with the idea of "promotive interaction" characteristic of cooperative — as opposed to competitive or individualistic — learning (Johnson et al., 2014). This encompasses not only the types of cognitive processes described in section 9.2.1 (explaining their understanding to peers, discussing concepts, questioning each other's arguments), but also social and interpersonal elements through which students promote each other's development, such as assisting, encouraging, and praising learning efforts, modelling social skills, and taking part in shared celebrations of success.

Important as these processes are, the emphatically positive, often emotional responses almost all participants had to the group evoke a greater scale of impact, and it seems the tutorials may have been serving deeper, unmet social needs. Almost all the participants had been attending this university for two academic years or more, yet their comments conveyed a sense of not knowing many people or having networks of friends within their course of study prior to the programme, suggesting that some students might find campus life lonely and isolating. As noted in Chapter 2, in terms of the TCF, entering studenthood may be construed as a liminal process — a view that will be returned to later in this section. Within broader work in education and psychology, the challenging nature of the adjustment to university study is well established, and the importance of social as well as academic integration into an institution in determining students' persistence and success has been highlighted (Cross et al., 2009; Johnson et al., 2014; Tinto, 1975, 1998). Interactions and relationships with peers have been found by numerous studies to be a major influence on students' cognitive and personal development at university, equalling and possibly exceeding formal classroom

interactions (Pascarella & Terenzini, 2005). In the same university context as this study, Govender (2014) finds that students' ability to form relationships with other students as well as academic staff is a key influence on successful access to university, and has a reciprocal impact on students' levels of engagement and social integration, as well as their agency, goals and motivation.

Participants in the current study implied that the tutorial groups afforded them opportunities to establish friendships and networks that were somehow largely absent from mainstream lectures. In their meta-review of cooperative learning research studies, Johnson et al. (2014) show how the positive interpersonal relationships and psychological health benefits (including self-esteem and social skills) fostered by cooperative learning can ease the considerable psychological adjustment that attending university demands of many students, and enhance their attitudes towards and experiences of university. While this was not a deliberate intention of the tutorial programme, it seems the cooperative learning approach brought important ancillary benefits in the form of strengthening and widening of friendships among peers in the same course of study. These networks were social resources that students could draw on to engage more effectively in their studies and the overall university experience.

The sense of belonging to a group fostered by the cooperative approach may also be linked to students' goals and motivation (discussed in section 9.2.6), and the development of the conative and affective resources required by disciplinary learning (section 9.2.7). This is suggested by participants' comments (section 6.2.2.3): "*When we worked together during the programme, it gave me hope that I would excel in economics … As a group, subconsciously [we] had to decide to make this a success or not, participate or not, and we did, because that was the goal*". These links are borne out by empirical studies associating cooperative learning with enhanced metacognition, willingness to attempt difficult tasks, persistence, intrinsic motivation, time on task, and transfer of learning (Johnson et al., 2014).

Turning to the TCF, participants' reflections on their emotions and experiences in the tutorial programme suggest that the group offered an appropriate "holding environment" (Winnicott, 1971, cited in Land et al., 2006, p. 200) — a "supportive liminal environment" that could provide students with a sense of safety as they struggled through the unease and anxiety of liminality towards disciplinary

understanding (Cousin, 2008; Land et al., 2006). The importance of providing a supportive liminal environment stems from the TCF's recognition of the strongly affective, transformative, identity-relevant nature of disciplinary learning — and indeed the parallel challenges students may face as they negotiate the broader liminal transition to studenthood (Cousin, 2008, 2014). The finding in section 9.2.3 noted participants' accounts of how their membership of the group helped to mitigate self-doubt associated with learning economics, and to endure the unease and anxiety of (as yet) incomplete understanding. The previous finding (section 9.2.8) highlighted participants' feelings of comfort, security and belonging elicited by being part of a group with common interests, experiences and perspectives; their sense of being recognized and valued within the group; and their views that the group contributed to a sense of adventure and discovery regarding their learning of economics.

The group offered "*a platform to express your ideas and grow as an individual*" (section 6.2.2.4). Expressing themselves and their understanding within the group using economic discourse was thus not only a mechanism of learning as described in section 9.2.1 above, but also arose as an outcome or manifestation of the type of learning fostered by group processes, and the capable self it activated (sections 9.2.2 and 9.2.3 above). In reflecting on their own learning, many participants noted feeling secure enough in the group and in their growing knowledge to express their own thinking and opinions freely: "*[t]he TC group showed me I shouldn't be closed off or afraid … and be confident when talking about eco's*" (section 6.2.2.5). This calls to mind the "will to speak" that might be included as an important disposition for learning as "becoming" (Barnett, 2009, p. 435). Similar findings regarding the potential for the development of self-concept and -expression through group-based pedagogy have been noted from a threshold concepts-oriented consideration of PBL, which "appeared to prompt a form of identity building through the group and a sense of being able to gain or construct a voice in the learning context" (Savin-Baden, 2006, p. 168). The notion of expression draws together the group processes that build conceptual learning, perceptions of belonging and security, the sense of feeling empowered and more capable, and the emergence and expression of a more confident self in disciplinary and personal arenas — the latter returned to in section 9.2.10.

In contemplating the nature of students' conceptual threshold crossings, Land (2015) has referred to the idea of "refuge and prospect" — a theory more often applied in aesthetics and architecture, which sets out to explain why particular (physical) environments feel secure or meet human needs (Appleton, 1975, cited in Dosen & Ostwald, 2013). Thus a supportive liminal environment offers students a view of worlds they may enter, from a place where they feel safe and comfortable. The notion of refuge and prospect seems an apt description of the significance of the tutorial group for participants — a space where belonging enabled becoming. While this might be so in any supportive learning environment, in the current study it was significant that participants attributed these characteristics to the peer group.

Although Meyer and Land (2005, p. 377) mention "mentoring or peer collaboration" as a possible way of easing the liminal traverse, most discussion of creating a supportive liminal environment in terms of the TCF has emphasized "what the teacher does to assist the learner in this space" (Higgs & Cronin, 2013, p. 163). Threshold concepts scholarship has not yet fully explored the potential of peer groups to provide support for the affective and identity-related aspects of liminality. This echoes the suggestion made in section 9.2.1 that the collaborative processes of constructing understanding in the group hold untapped potential for facilitating the cognitive aspects of TC learning. In the TCF and in practice, these aspects of pedagogy and emotional support, or of 'teaching' and 'holding', are as entwined as the cognitive, affective and identity-related aspects of learning.

9.2.10 Becoming: Among peers, in the discipline, in the world

Learning brings new perspectives and personal development, which may bring about changes to students' self-concepts in disciplinary and personal domains.

The view of learning in the tutorial programme suggested by participants' descriptions as discussed in the previous nine findings is one of an all-encompassing transition that leads to changed views of the world and oneself. These transformations seemed to occur not only in regard to disciplinary understanding, but also in broader metacognitive spheres. Beginning with the latter, students came to see learning as socially constructed understanding of meaningful knowledge, and themselves as capable and active agents

of their learning (sections 9.2.1–9.2.3). Breaching this metacognitive threshold brought transferable insights that comprised an important part of the personal growth described by many participants. Thus *Learning about Learning* elaborated in Chapter 7 highlighted a changed view of learning as understanding rather than cramming, and a recognition of the power of discussion and articulation to build understanding ("*I developed in my academic world*", section 8.3.1.1). Many were surprised by insights regarding their social selves: "I got to share [my thoughts and feelings] and I discovered the other side, that I can interact easily with people and can think out of the box ... I got to understand myself and how I work in a group" (section 8.3.1.2).

Threshold concepts scholarship considers "intellectual maturation" (such as the shifts just described) and "disciplinary enculturation" to be entwined (Cousin, 2008, p. 263), and this appears to match the findings of the current study. The shift in identity associated with learning in the group seemed to go beyond becoming an economics student or future economist (considered in more detail shortly): it was also about becoming more confident and sure of oneself, and having a sense of personal growth. Together, the meanings participants gave to the Personal Outcomes affinity (elements in sections 8.3.1.1–8.3.1.5) conveyed a sense of expansiveness, as their worlds were enlarged, their belief in their own capabilities enhanced, and their sense of themselves made firmer through their learning in economics over the course of the programme. The growth they described occurred at various scales and in social, disciplinary and personal domains, encompassing newfound academic confidence (in economics and more broadly) and enhanced interpersonal skills, changed perspectives, and for some participants, a new sense of themselves and an emerging disciplinary identity.

These shifts recall self-expansion theory (Aron et al., 2004), mentioned in the context of the peer group and participants' sense of their own capability in sections 9.2.3 and 9.2.4. Individuals may attain an expanded self-concept, increased potential efficacy, and greater self-concept clarity by undertaking challenging and novel tasks, as well as by acquiring new perspectives, resources and identities through interaction and identification with others. In the workplace, these routes to self-expansion have been linked to increased satisfaction and commitment, higher self-esteem, and application of greater effort to difficult tasks (McIntyre, Mattingly, Lewandowski & Simpson, 2014). It seems likely that similar processes account for the sense of growth participants

reported in the tutorials, where both routes were evident — novel tasks in the form of the tutorial activities, and interaction with peers whose perspectives, resources and identities they could to some extent incorporate into their own. It is possible that this type of general personal growth — or self-expansion — adds to students' psychological resources (discussed in section 9.2.7) and strengthens their abilities to manage more discipline-specific liminal learning challenges.

Turning to disciplinary learning, participants' descriptions suggested that reaching understanding of certain concepts brought changes in their perspectives on the rest of the discipline and real-world economic phenomena; in aggregate, these new perspectives constituted an economic gaze, through which they could interpret events in their own lives and the world at large (sections 9.2.4 and 9.2.5). In terms of a threshold concepts view of learning, this changed worldview could be seen as a reformulated meaning frame — an ontological shift that brings a transformed personal identity, into which new understandings and WTP have been assimilated (Meyer & Land, 2006). Participants' comments suggested a personal appropriation of economic logic (section 7.3.1.1) — "*you don't study because you have to study, you can also use it in your life, you can use economic concepts in real life*". The shift in identity associated with a reorganized conceptual structure (Davies, 2012) is also evident in the suggestion that gaining these insights somehow distinguished them, as economics students or economists, from everyone else (section 7.3.1.2): "*... you can think like an economics student. The concepts… are concepts that only an economic person should know, not anyone from the streets. ... You don't just see what everyone else is seeing ... And that's what I like, that's what I like…*".

The conjunction of a newly attained disciplinary perspective and a shifting identity suggested by the last quote is in line with Barnett's linking of students' "coming to know" with their being and becoming: "the process of coming to know has person-forming properties … knowing has implications for becoming" (2009, p. 435). This arises because disciplines are defined by "their own key concepts, truth criteria and forms of life … they have their own standards embedded in them … they produce a measure of strangeness; they offer perspectives on the world not ordinarily available" (2009, p. 436).

That the development of an economic gaze may be experienced as a personal change is further supported by participants' reflections on their Personal Outcomes. Section 8.3.1.5 — "*I got to think like an economist and I got to do things differently*" — relates various instances of 'doing economics' in everyday contexts outside of the classroom, such as interpreting economic news, discussing economics with friends or family, or adding economic articles to a Facebook profile. These could be read as indicators that students were increasingly assimilating disciplinary understandings into their own identities, or seeing themselves as disciplinary insiders. The confident use of economic language could be another such marker, as noted in section 9.2.5.

These ideas around disciplinary identity resonate with principles of situated learning (Lave & Wenger, 1991; Wenger, 1998). In this view, which has clear affinities with the TCF, participation in communities of practice enables learning; learning includes inseparable processes of enculturation, and so changes who we are, as much as what we know (Cousin, 2008). As noted in Chapter 3, Davies (2012) has pointed out that the very phrase "learning to think like an economist" implies that learning is a matter of identification, as well as of thinking; it involves constructing one's identity in relation to a community, mastering the disciplinary "repertoire", including concepts, language, tools and rules, and becoming an active participant in practice (Wenger, 1998). With regard to the study, the relevant community of practice with which participants identified may be defined at two different scales: the tutorial group itself, as a community of economics students; and the wider community of professional economists, for those who aspired to further study or a career in the discipline. The first offered benefits even for those students who did not see themselves in the second.

Students found that they shared a common purpose, and related easily to each other in the group because they could take for granted a level of shared economic understanding and discourse as "*economists in the making*" (section 6.2.1.9). They began to develop a disciplinary identity through their interactions, practising economic skills in a nurturing and risk-free environment, among peers with similar goals and interests (section 6.2.2.2); their newfound confidence in using economic language was a uniting factor that signalled their emerging status as 'insiders' to the discipline (section 7.3.1.4). This emerging disciplinary identity strengthened the sense of community within the group, enhanced their learning, and encouraged them to embrace new perspectives and a

disciplinary way of thinking. These views were expressed more strongly, but not exclusively, by students who planned to major in economics (section 6.2.1.9). For these students, participating in this small-scale community might be seen as paddling in the shallows before joining the wider community of economists. For those who did not plan to take economics beyond level 2, the group remained a community in its own right with which they could still identify. The extent of their participation would be determined by their learning goals, returned to below.

For some, self-insights reached over the semester extended to a greater sense of clarity about their future plans involving the discipline — "*I'm more interested in studying eco's… my mind has been opened to a new kind of way of thinking. I got to discover myself*" (section 8.3.1.5) — which was also conveyed as an element of Goals in "*This is the thing that I want to do*" (section 8.2.1.4). Several participants who felt they had clarified their future plans in relation to economics explicitly attributed this to the tutorial programme: "*During this tut group I've learnt that this is the thing that I want to do … Now the picture's becoming … clearer, just because I went to the tuts … At the beginning of the tuts, the group, I was ok, I want to be an economist — I would say that and not really mean it; but now it's clear what I want*" (section 8.2.1.4). Part of the explanation for this might be that the tutorial format and group processes gave them time and reason to reflect on themselves in the discipline, and thus crystallize longer term goals. Further, the sense of disciplinary community, together with participants' growing self-efficacy and capability (section 9.2.3), may have contributed to their self-conceptions as students of economics or future economists, while their enjoyment of and engagement with disciplinary content in the tutorials (sections 8.4.1.5 and 8.4.1.6) may have persuaded them to incorporate economics into their future plans. Davies and Guest (2009) suggest that because grasping threshold concepts is indicative of thinking like an economist — which involves being and doing as well as thinking — it might lead to greater identification with economists, with implications for students' future choices in their studies and beyond.

The process by which participants' sense of belonging enabled their becoming seems to have been mediated by their personal goals, which influenced the extent of the shift in identity they experienced (reinforcing the idea of Goals as a nexus of learning, discussed in section 9.2.6). Participants who emphasized a desire for understanding and

articulated more reflective, longer term, or discipline-focused goals also recounted more identity-relevant growth and development, attributable in part to the "*enthusiasm and aim*" furnished by their goals (section 8.2.1.2). Those who had narrowly conceived, utilitarian goals ("*just to pass*"), while still (with one exception) feeling that they had gained from the tutorials, described a limited range of outcomes highlighting academic performance and social benefits arising from group processes (summed up in the final composite quote under section 8.3.1.5). A possible explanation for this divergence may be that the former group of students engaged with the tutorial programme in a deeper, more fully committed way, because of their intrinsic interest and focus on understanding, and so stood to gain more than those with a narrower motivation.

The more students' goals foreground their understanding or aspirations in economics, the more meaningful, personally significant and identity-relevant they will consider discipline-related outcomes. In the SID, these linkages are reflected in the Economic Thinking — Goals — Personal Outcomes vector, which may be interpreted as representing the alignment of the discipline as experienced with students' goals and identity described in section 9.2.6. The centrality of this congruence underlines the conjunction of the social and the personal in learning. For participants in this study, it seems effective learning was facilitated both by the sense that they were accompanied, held, and admitted by the peer group, and that they had autonomously chosen a course of study that they experienced as meaningful, valuable, and congruent with their individual identity and integrity. Human yearnings for inclusion and agency (Kegan, 1982) are reflected in the ideas of belonging (to a peer group, an institution, a discipline), and becoming (to which individual meaning and values are essential).

Synthesis (9.2.5–9.2.10): Conative and affective responses and identity shifts

These five findings uncover aspects of learning that are mostly untouched in economics education research outside of taking a threshold concepts orientation. While much of the account of students' learning aligns with the TCF, there are also elements that have previously not been deeply explored, and may be usefully mapped onto the TCF. Notably, participants' goals were an important mediator of their learning, and could provide direction and motivation in the face of liminal challenges. Goal construals were

important in determining students' approaches to learning, and connected the cognitive and metacognitive aspects of learning (sections 9.2.1–9.2.5) with affective, volitional, and identity-related elements, mediating the reciprocal impacts of these interdependent sets of factors and processes — the Head and Heart loops — on each other. For participants, the peer group played a significant role in supporting and facilitating affective, conative and identity-related responses to learning. The group provided a supportive liminal environment that fostered a sense of safety and belonging, within which students could express themselves with increasing confidence and affirm their expanding sense of self within and beyond the discipline.

9.3 Concluding comments

The findings abstracted from students' descriptions portray their learning in economics as an expansive process that encompassed far more than mastery of content. The findings, broadly sketched, align with the TC view of learning as a transformative, affective process, and resonate with many of the issues around content and pedagogy in the economics higher education literature, offering detailed and contextualized confirmation as well as some new insights. Participants' descriptions of their learning in economics over the semester emphasized their experiences in the tutorial sessions, casting Group Dynamics — the group interactions and processes they encountered — as an important energizer of their learning. The multiple and closely entwined effects of Group Dynamics supported and promoted cognitive, affective and conative dimensions of disciplinary learning, and were in turn engendered by the pedagogical approach taken in the tutorial programme: active, cooperative learning centred around group discussion.

While participants' descriptions of their learning experiences in the tutorials were almost universally positive, it is important to bear in mind that these were evoked in a 'greenhouse' — a learning situation arranged to approach the ideal conditions suggested in literature and theory, to optimize their learning of economics threshold concepts in order to study the details of this process. Their strong positive reactions to the group processes are thus to be expected. It remains significant that the tutorial programme was not an unqualified success in the sense that all participants passed the module; and within the group, even at the time of the interviews (late in the semester), there

remained unresolved difficulty and stuckness with content (as described in Chapter 7). However, it seems fair to say that the trouble with disciplinary learning that participants still experienced lies outside of the group processes that characterized the tutorial sessions, in aspects faced by all mainstream first- and second-year economics students who are expected to learn in large-class lectures, without the group-related benefits of this type of tutorial programme. The positive responses to the tutorials serve to highlight potential problems associated with traditional pedagogy, and perhaps point towards ways in which we could create a learning environment and approach that might better enable students to meet the demands of disciplinary learning.

In concluding the study, Chapter 10 reflects on how these findings have addressed the critical questions posed, and draws out their implications for practice and research.

CHAPTER 10
ECONOMICS STUDENTS' LEARNING IN A TC-INFUSED HIGHER EDUCATION LEARNING PROGRAMME

10.1 Introduction

The previous chapter offered ten key findings, arranged to constitute the interlinked, potentially reinforcing Head and Heart loops that I have used to portray the experiences and processes of students' learning in the threshold concepts-infused tutorial programme. These findings were discussed in relation to existing research in economics education, and TCF scholarship. In this chapter, I provide final comments on the thesis. The following section presents an overview of the study; section 10.3 notes some limitations; and section 10.4 draws out some implications for practice and further research. Section 10.5 describes a tentative model grounded in the study findings, which may offer insights to economics educators and to researchers using threshold concepts or cognate orientations. Concluding thoughts are offered in section 10.6.

10.2 Overview of the study

10.2.1 Background, rationale and research questions

In Chapter 1, I introduced the study, highlighting the need to deepen our understanding of students' learning of economics against a backdrop of interconnecting sources of disquiet. The discipline is experienced as difficult by many students, with high failure and dropout rates and concerns about the quality of learning, globally and in South Africa, where issues of disciplinary difficulty may be compounded by students' underpreparedness linked to poor schooling. Enabling academic access and success here is framed by social justice imperatives, and is set in an increasingly turbulent landscape as student protests call for free and "decolonized" higher education. At the same time, the discipline of economics is subject to growing disillusion and critique on a global scale, and its relevance, use and moral status have been questioned. Economics educators appear to have been slow to respond to these issues, continuing to teach

largely unchanged content in traditional ways, while consistently expressing concern about the outcomes.

Against this background, I noted a lack of qualitative understanding of how students learn in economics, of the experiences and processes involved, of the difficulties, and of how learning may be supported in our context. This was the broad area I set out to explore in this study. The theory of threshold concepts offered an appropriate framework that could accommodate the questions around learning in which I was interested, to yield insights beyond quantitative success factors or assessments of progression in understanding. The TCF emerged from studies of teaching and learning in economics, and its tenets resonated with my experience of teaching economics to undergraduates. In drawing together relevant ideas from a range of learning theories and other disciplines, the TCF appeared well suited to framing a holistic, qualitative view of economics students' learning.

In seeking to deepen understanding, I therefore designed a tutorial programme informed by a TC orientation, which could offer a vehicle to study learning — an arranged situation, akin to a greenhouse, which sought to offer optimal conditions for growth in order to study the growth processes rather than test the conditions. The research questions that structured this study were:

- How do economics students learn in a threshold concepts-infused higher education learning programme?
- Why do students learn in this programme in the ways that they do?

10.2.2 Literature review: Teaching and learning in economics

Because a threshold concepts perspective foregrounds disciplinary learning, I took a wide-angle view of existing scholarship around teaching and learning in economics, which I reviewed in Chapter 2 in terms of three intertwined strands of research. The first of these focuses on teaching techniques and learning concerns. Pedagogy, curricula and assessment in undergraduate economics courses are similar the world over, and common problems, long known, still persist in the form of large classes and a reliance on lecturing and textbooks, rather than encouragement of wider engagement (Colander

& McGoldrick, 2009; Siegfried, 1991). Concerns have been noted about the conceptions of knowledge and approaches to learning this type of delivery fosters (Bloemhof, 2012; Simkins & Maier, 2009), but it continues to be the dominant approach globally (Goffe & Kauper, 2014). The reliance on lectured delivery is a likely contributor to the poor learning outcomes noted in economics (Hansen, 2009), and the view that many students emerge from introductory courses without having mastered the basics because too much content is covered too rapidly (Frank, 2005). Accordingly, students often do not develop the transformed conceptual structures that add up to the ability to "think like an economist" (Siegfried et al., 1991; McGoldrick & Garnett, 2013), relying instead on surface approaches to learning. Consequently, they struggle with higher level application and analysis, and are unable to transfer their knowledge to real-world contexts (Davies & Mangan, 2008). Most of this research has been conducted in the UK, USA and Australasia. Similar work is scarce in South Africa, but emergent qualitative insights echo international concerns: South African students similarly struggle to understand, connect and apply economic concepts (Ojo, 2012).

In response to these concerns, research has explored innovative teaching and learning approaches, based on active learning and constructivist pedagogy, and often entailing social processes. This line of work reflects a recognition of the benefits of cooperative learning (Becker & Watts, 1998; Hoyt & McGoldrick, 2012; Watts & Becker, 2008). Most of this research consists of descriptions and examples to guide implementation; some empirical evidence of its effectiveness is provided by quantitative investigations (McGoldrick, 2012; Miller & Rebelein, 2012), including findings pointing to the effectiveness of alternative pedagogies in South Africa (Davis, 2011). Less attention has been paid to explaining the impact on learning, and little qualitative detail exists to suggest why these approaches might be effective.

The second strand of research centres on curriculum critiques: as well as being overstuffed with theory, at first- and second-year level in particular, curricula have been characterized as overly narrow, abstract, and /or irrelevant. Calls for a deeper focus on a smaller set of critical concepts (Frank, 2005) coexist with suggestions that the lack of exciting and relevant new content is a more significant problem (Becker, 2004). Curricula have been critiqued on grounds of ideology, relevance and context, particularly with regard to the dominance of neoclassical orthodoxy. The discipline

faces charges that it not ideologically neutral, but is portrayed as such (Docherty, 2010; Heilbroner, 1987). Moreover, the questions focused on in most undergraduate courses are abstract and irrelevant to students' areas of interest and concern (Colander & McGoldrick, 2009; Emami, 2005). The increasingly monist focus on neoclassical theory, to the exclusion of alternative viewpoints and historical and contemporary context, has been implicated in the discipline's perceived irrelevance and the erosion of students' motivation (Mendeloff, 2008, Van der Merwe, 2006) — a particularly pertinent critique in view of the Rethinking Economics movement globally, as well as debates around "decolonizing" curricula in South Africa.

The third research strand comprises studies taking student learning perspectives (Entwistle, 2009). Drawing on cognitive and social learning theory, this line of scholarship focuses on the processes of learning, and includes students' approaches to studying, conceptual development, and experiences of learning. Concerns about learning may be understood in terms of students' taking deep or surface approaches (Marton & Säljö, 1976), and the contextual factors impacting thereon, including teaching and assessment practices, with clear relevance to the pedagogy and curriculum debates in the other two strands of economics education research. Phenomenography (Dahlgren, 1984) has allowed a fine-grained look at conceptual development, and has illuminated some conceptual changes that learning economics requires of students (e.g. Meyer & Shanahan, 2002; Pang & Meyer, 2010; Shanahan & Meyer, 2003). Developing students' metalearning capacity is an important implication of this view (Meyer & Shanahan, 2004). The foregrounding of students' experiences distinguishes this approach from most research in economics education, and is also evident within the threshold concepts perspective on learning, which emerged largely from this strand of scholarship.

Chapter 2 also catalogued potential sources of economics-specific difficulty noted in existing research. These include the three 'languages' students must master (verbal disciplinary discourse, mathematical and graphical expression); the need to rework preconceptions and lay understandings; the conceptual complexity of composite disciplinary ideas; disciplinary epistemology and the rules of constructing arguments; and the abstract nature and perceived irrelevance of many disciplinary ideas. Understanding of the extent to which these sources of difficulty may be pertinent for

students in our context is limited and largely speculative, although some are supported by suggestive quantitative evidence — for instance issues of language and mathematical ability (Bokana & Tewari, 2014; Parker, 2006; Snowball & Boughey, 2012), and abstractness and relevance (Van der Merwe, 2006).

10.2.3 Theoretical framing: Threshold concepts

In Chapter 3, I considered the theory of threshold concepts (Meyer & Land, 2003, 2006) that frames the study. In this view of learning, which weaves together insights from several learning theories and other disciplines, certain concepts are seen to act as portals to transformed understandings that define disciplinary ways of thinking. Crossing these learning thresholds involves not only cognitive but also affective processes; because this knowledge is transformative, resulting in new ways of reading the world, it may also bring a shift in the learner's view of herself. While it foregrounds disciplinary content, the TCF also sees learning — and difficulty — as inseparable from the learner and her social and personal context. The experience and processes of learning educationally critical but possibly troublesome content transcend disciplinary boundaries (Schwartzman, 2010), and reaching understanding of a threshold concept in any field is likely to be experienced as (Meyer & Land, 2003):

- transformative, precipitating conceptual and ontological shifts;
- probably irreversible;
- integrative (revealing interconnections among concepts);
- possibly bounded (serving to demarcate the discipline); and
- potentially (possibly inherently) troublesome, because of particular features of the knowledge to be gained (Perkins, 1999).

Central to this view of learning is the (anthropological) notion of liminality: coming to understand a TC requires crossing a liminal space of uncertainty and incomplete understanding, making a recursive path from old to emergent understandings and views, which is likely to involve some discomfort, anxiety and perhaps a sense of loss. Students' responses to challenges of liminality are central to their learning, but remain a relatively unexplored aspect of the framework (Rattray, 2016; Schwartzman, 2010). If

students' responses to liminality are defensive, it is likely they will remain stuck at incomplete understanding, or withdraw, and not breach the necessary threshold. A reflective response enables them to reconstitute the meaning frames by which they make sense of the world, and ultimately to develop a new sense of themselves — which is closely tied to the internalization of disciplinary WTP, and identification with a disciplinary community.

The TCF has been applied in several studies in economics, its discipline of origin. Davies and Mangan (2006a, 2007a, 2008) have offered refined categories of concepts in economics, of which discipline thresholds and procedural or modelling thresholds have the transformative, integrative properties highlighted by the TCF. They further suggest that these concepts work in a web of interconnections and together comprise a disciplinary bigger picture. The web they suggest (Davies & Mangan, 2006a) is not couched as a definitive list of economics TCs: as Cousin (2008) has stressed, teachers and researchers should bear in mind that TCs are situated, and will never be stable or uncontested. Nonetheless, the microeconomic concepts in the web, which informed the ETC activities (Davies & Mangan, 2006c) I used in the tutorial programme, matched my perceptions of troublesome, transformative content based on years of teaching undergraduate microeconomics. Further important elaborations to the TCF within economics include the conjunction of understanding and ability to apply concepts, and the recognition that identity shifts arising from conceptual reframing are implicit in the development of students' ability to think like an economist (Davies, 2012).

Work in economics has thus far refined and supported the TCF. While taking a more holistic view of learning, it also speaks directly to issues in broader economics education research, in seeking forms of engagement — in terms of both pedagogy and content — which will foster the types of conceptual and ontological shifts that disciplinary learning calls for. Recently, the idea of integrated threshold content knowledge has been proposed (Meyer & Timmermans, 2016), and this is where I hope the current study's findings may contribute.

10.2.4 Methodology

Seeking an in-depth, holistic understanding of economics students' learning, I used a qualitative, interpretive approach and a case study design that would enable me to explore participants' experiences and perceptions of their learning. This aligns with the social constructivist orientation of the TCF, which defines the essential features of threshold concepts from the learners' perspective. Case study research is strongly rooted in context, and my findings are specific to this case, beyond which I make no claims; nonetheless, they may offer some analytic generalizability (Yin, 2009) and have wider resonance with similar situations or broader threshold concepts theory.

A purposive sample of volunteers from Econ 202 participated in a semester-long tutorial programme that ran alongside mainstream lectures. This could be likened to a greenhouse, or an arranged situation (Naidoo & Vithal, 2014), in which I was able to use cooperative learning pedagogies not available in the current mainstream situation but established in theoretical and empirical work as conducive to learning. My use of small-group discussion around structured tasks was strongly complemented by the ETC activities that I drew on as tutorial exercises (Davies & Mangan, 2006c), which embed economics threshold concepts in relatable examples and break the analytical task down into component steps. As a form of homework, I asked participants to write weekly reflections about their learning in economics, and in turn wrote replies to those who submitted their writing to me. I expected these to have some intrinsic value in enhancing students' metalearning (Bargate, 2012; Ward & Meyer, 2010), as well as providing an additional data source for the study.

The larger part of my data was generated and initially analyzed using IQA — a research method consistent with the interpretive, social constructivist paradigm of the study. IQA is a novel method that has as far as I can determine not been used in economics education, and has also not been combined with a TC perspective. It resonates strongly with the emphasis the TCF places on students' experiences, because participants are deeply involved in exploring their learning. Because the researcher plays a facilitative role in data generation and initial analysis, rather than being cast as the expert, IQA was also in harmony with the power relations that inhered in the tutorial programme: as the group had been entrusted with responsibility for their learning, so they were entrusted with generating and analyzing the data that represented their experience.

The relationship I had formed with the group over the semester was important in securing their willingness to commit time and reflective effort to the IQA processes. IQA involves two main phases of data production: focus groups and interviews. I had two focus group sessions at the end of the term, in which participants generated a view of learning on the programme at group level. Following IQA protocols led me to represent the affinities (or themes) identified by the focus group into a Systems Influence Diagram (SID) depicting the group's conception of their learning. The focus group sessions were followed by semi-structured individual interviews, which added depth to the focus group data as participants elaborated on their personal experiences with regard to each affinity.

Because it is protocol driven and entrusts data generation and interpretation to participants, IQA has inbuilt mechanisms that enhance rigour. In foregrounding the students' perspectives and working with dismantled power relations, IQA assisted in mitigating possible issues around my influence in the research process, as the participants' lecturer and tutor as well as the researcher. The sources of IQA's strengths might also present limitations. My use of IQA elicited only the views of the participants, and because at times I thought my perspective as an insider researcher might add a dimension to students' words, there are a few occasions in the data chapters where I have departed from IQA procedure, for instance by quoting from my own reflective research journal. IQA captures only what is said (or written during brainstorming) in the focus groups and interviews. Because the focus group aims at consensus, it is possible that the affinities may hide the silences of participants who disagree with the group view, and these would not necessarily be uncovered in the interviews, the scope of which is determined by the affinities. Similar trade-offs arise in the use of composite quotes as opposed to tracking individual participants in reporting the data; again, where I felt it would be helpful I departed from IQA practice to separate out divergent views. The written reflections, which were not part of standard IQA process, could serve to offset possible shortfalls of the focus groups and interviews by offering participants an additional channel to express individual views. On analyzing these, I was satisfied that the data therein was accounted for in terms of the affinities, and I was able to include appropriate excerpts in the composite quotes to supplement the interview descriptions.

10.2.5 Findings

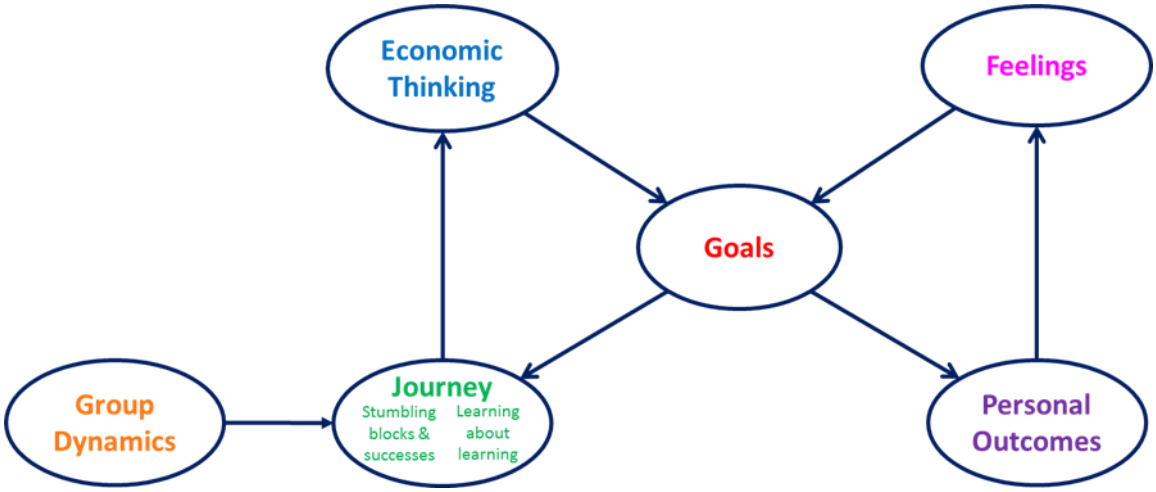

Figure 15. SID: Students' learning in the TC-infused programme

The focus group identified six affinities — themes or components of meaning of their learning in the tutorial programme — and the IQA processes led me to construct the SID above, which captures how the group theorized the interrelationships among these affinities. The features of the SID as a whole suggest some insights regarding the group's understanding of their learning, which were substantiated by the thicker descriptive data from the interviews and written reflections. The primary driver of the system was Group Dynamics, which impacted on every other affinity. The Learning Journey (comprising *Stumbling Blocks and Successes*, and *Learning about Learning*) and Economic Thinking were secondary drivers, while the outcomes were Goals, Personal Outcomes and Feelings. In the SID, two sub-systems or positive feedback loops are evident: Learning Journey – Economic Thinking – Goals comprise the cognitive and metacognitive Head loop, and Goals – Personal Outcomes – Feelings form the affective and identity-related Heart loop. Goals played a central role in connecting the two interlinked sub-systems, which are potentially not only self-reinforcing, but may also reinforce each other in an ongoing lemniscate or figure of eight path.

Group Dynamics — the group interactions and processes arising through the cooperative learning pedagogy of the tutorials — enabled and supported cognitive, metacognitive and affective aspects of learning. Through processes of discussion and

articulation within the group, students constructed understanding of economic concepts; they recognized this understanding based on "knowing why" as being quite different to the memorization they had tended to resort to in response to traditional lectured delivery. Their changing conceptions of knowledge were reflected in deeper approaches to learning. Participants' experience of cooperative learning in the tutorials was accompanied by a sense of empowerment and capability, where before many had felt self-doubt. These new conceptions of knowledge and learning, and of themselves as capable learners, were important metacognitive shifts that made up *Learning about Learning*, one component of the overall Learning Journey affinity. The other was *Stumbling Blocks and Successes* — particular economic concepts and techniques that were (at least initially) sources of trouble. Disciplinary learning was not an automatic process; difficulty and stuckness were commonplace, and their primary source seemed to be in the abstract nature of many economic concepts. Seeing their use through relatable applications facilitated understanding, and enhanced agency as students felt they were gaining worthwhile, empowering knowledge. Comprehending particular concepts and techniques was often experienced as a breakthrough that enabled understanding of related ideas. Cumulatively these understandings constituted the development of Economic Thinking — an economic point of view or gaze, which afforded them a changed perspective on real-world events. Economic Thinking also manifested in mastery of economic language, which became an expression as well as a means of learning.

Goals played a central role in students' learning, whether they were construed in narrow, utilitarian terms (focused on passing the module), or emphasized an intrinsic desire for deeper understanding, or took a longer term view encompassing further study and career aspirations. Goals could guide learning behaviour and provide motivation to persist in the face of difficulty, impacting both the Learning Journey and students' Personal Outcomes — their academic, social, and personal development — depending on how they were construed. If goals emphasized learning, and reflected a student's sense of having freely chosen to study a self-relevant discipline, they could amplify the reciprocal effects of the Head and Heart loops they connected. Feelings — affective responses, both positive and negative — emanated from learning and engaging with content, from assessment, and from the learning environment. These feelings, mediated by students' Goals, in turn influenced their learning choices and behaviour. Persisting

and progressing in learning made demands on students' psychological resources, such as self-awareness, self-belief, hope and resilience. Group Dynamics had a significant influence on Feelings and Personal Outcomes: the sense of belonging, comfort and safety among peers in the tutorial groups encouraged students to express themselves freely, and for many, facilitated the emergence of a clearer sense of self in relation to the discipline.

These findings are broadly consistent with the TCF in highlighting that learning has strongly affective aspects entwined with the cognitive; that it might entail periods of stuckness and liminality; that particular concepts are likely to be both troublesome and — once mastered — transformative; and that disciplinary learning has implications for students' worldview and identity. Additional insights are suggested by participants' portrayals of the roles of Group Dynamics and Goals in their learning. Goal construals would seem to play an essential part in moving learners through liminal learning challenges. Peers and cooperative learning processes appear to hold significant potential for supporting cognitive, metacognitive and affective aspects of learning and facilitating the emergence of a new sense of self in relation to the discipline.

10.3 Limitations

In contemplating the findings of this study, one should be cognizant of its limitations. My case study drew data from twenty participants in one second-year Microeconomics module, and from myself — the lecturer who was also the tutor on the programme in which learning was studied, as well as the researcher. Different groups of students, different modules in economics and other subjects, different years of study, or different tutors/lecturers may realize different results. The sample was small, and in effect was made up of self-selected students who had volunteered to take part in the programme. Given the nature and purpose of the study, my main concern was to attract students who would participate in the programme and subsequent IQA processes, and provide rich data; I did not attempt to select a representative sample, nor even to identify the dimensions across which representivity might be sought. The results are therefore not statistically generalizable beyond the scope of the case study.

Students would have experienced learning in the programme differently, depending on intrinsic factors and individual biography, including, for example, academic abilities, home background, schooling history and contemporary learning experience, learning styles, and personality traits. I did not explore these individual factors and their impacts in any detail beyond the extent to which they came up in the focus group and subsequent interviews. I did not specifically seek data regarding variation in students' levels of 'preparedness' for university study linked to their schooling — a significant question in the South African context — and therefore cannot explain in detail or with certainty the ways in which the difficulties students described may be more challenging for those with a poor schooling background.

The study drew on students' own perceptions of their experiences, and there may be potential bias in this self-reporting (Kvale, 1994). Because I was interviewer and researcher, as well as lecturer and tutor on the programme, they may have held back from revealing information or opinions they thought might reflect negatively on them, and may have been inclined to respond in ways they thought would please me, despite steps I took to mitigate this. Participants may have also varied in how self-aware and how candid they were. I did not set out to evaluate students' learning as part of this study to see whether their self-reported experiences of having understood threshold concepts could be substantiated with evidence of improved analytical ability. Nor did I track their assessment performance over the semester, or compare it with that of the rest of the class. In short, the findings of this study have taken participants at their word.

A strength of IQA is that data is generated and analyzed by the participants themselves. This means, however, that the whole process may stand or fall on the focus group: the focus group is pivotal because it produces the affinities that structure and circumscribe the deeper exploration in the interviews. My confidence in the findings is enhanced by the fact that the focus groups were well supported by the students, and that the themes that emerged from the reflective writing were compatible with and could be accommodated by the same set of affinities. Nevertheless, I note that a different method of generating and analyzing data may have yielded different results.

In addition, this study only considers the perspectives of the twenty students who participated in the tutorial programme until the end of the semester. I did not engage

other stakeholders — lecturers, tutors, or students in the mainstream class who did not take part in the programme — whose insights may have led to different findings.

The tutorial programme was a 'greenhouse'; it was tailored to my research requirements to be a vehicle to study learning, and was very resource intensive in terms of the time and energy it required from me. With current budgets and constraints on staffing, venues, and student timetables, it would not be feasible to roll out an equivalent intervention for the entire Econ 202 class of several hundred students across two campuses. However, the intention was not to test an intervention, but to draw insights that may deepen understanding of students' learning in economics.

10.4 Implications

These findings suggest that generally, understandings of what it means to learn and to teach economics in higher education, as reflected in dominant teaching practices and related research globally and in South Africa, are too narrow. Prior research using the TCF has shown that effective learning in any discipline is a strongly affective, transformative process that involves far more than acquiring concepts and being able to replicate disciplinary techniques. I will not redraw the general implications for teaching that emerge from a TC view of learning (Cousin, 2006; Davies & Mangan, 2008; Land et al., 2006) and that informed the ETC activities (Davies & Mangan, 2006c), but will focus on additional implications for practice and research arising from my findings.

Teaching in undergraduate economics still relies heavily on lectured delivery, at UKZN and in most universities around the world, despite substantial and mounting evidence within economics education research regarding its shortfalls (Goffe & Kauper, 2014). This traditional delivery may unwittingly produce the passivity, invisibility, anonymity, and lack of accountability that Shulman (2005) considers the most significant hindrances to learning in higher education. The study findings suggest possible additions to Shulman's list: disengagement or lack of commitment (due to not finding content meaningful and identity-relevant), and self-doubt and anxiety (linked to the pressure of having to absorb and retain the dispensed 'knowledge'). These factors may explain why many students rely on a surface approach to learning in undergraduate economics.

Evidence that students may reach their second year of economics studies without having fully understood essential disciplinary concepts and techniques covered in introductory courses points to a need to rethink pedagogy, curriculum and assessment in both introductory and intermediate courses. The study findings offer support and substantiation for calls within economics education research for greater use of active, cooperative learning pedagogies. Students described the processes by which they constructed conceptual understanding, as well as the aspects of affective support and personal development they experienced in the group. While it is not feasible to roll out a similar programme for a class of several hundred, it is worth applying some "pedagogical imagination" — conceiving that things could be done differently (Naidoo & Vithal, 2014) — together with further research, experimentation and reflection, to identify elements from the tutorials that might be leveraged to support and facilitate learning on a larger scale.

With regard to cognitive aspects, the mechanisms of discussion and articulation engendered by cooperative learning approaches would seem to offer some unexploited potential for bringing about deep and transformative conceptual learning. It is worth investigating and experimenting with ways in which we might provide and structure learning experiences within the mainstream that encourage deliberative verbalizing, and move students from everyday talk towards comprehensible, conceptually rich articulations.

In view of the study findings indicating that much learning happens outside of formal lectures, further research may explore the benefits and feasibility of a "flipped classroom" approach (Kahn, 2011, cited in Roach, 2014): the learning process is "flipped" in that students watch lectures online, freeing up classroom time for more meaningful, active and collaborative learning activities. The approach is still in the early stages of development and adoption, but emergent research reporting flipped experimentation in economics suggests it is positively received by students, and can enhance performance (Roach, 2014). A flipped classroom approach might mitigate many of the problems associated with lectured delivery, and in allowing for greater interaction (between teacher and students, and among students), holds promise for harnessing beneficial processes such as those noted in the tutorials.

While a shift towards more active learning puts the onus on students, this does not imply abdication on the part of teachers — it may require intensified effort and care in structuring and facilitating learning experiences, and maintaining momentum and engagement. My experiences in the tutorial programme suggest that a likely challenge may be striking an appropriate balance between facilitation and more direct teaching, so as to foster students' sense of capability while providing sufficient guidance to ensure accurate conceptualizations (Colander, 2004; Kirschner, Sweller & Clark, 2006).

If accommodating cooperative learning experiences within the mainstream includes the formation of small groups for the duration of the course, it may also harness the affective support which the tutorial groups offered students by "leveraging" caring peer relationships (Johnson & Johnson, 1999) to provide a more emotionally supportive or "holding" environment (Land et al., 2006). It seems the peer group may be well placed to be entrusted with some aspects of emotional support, by virtue of their proximity to affective as well as contextualized aspects of learning. In a large class, small groups may offer an effective way of providing the emotional support that one lecturer would not be able to give. Further research is warranted to identify how this may be accommodated and facilitated at scale.

For the large proportion of underprepared students in South African higher education, the metacognitive and affective challenges of disciplinary learning are likely to be more pronounced. Gaps in academic literacies and verbal and mathematical skills as a result of poor schooling may be substantial, and the emotional demands of the transition to university study more exacting (Cross et al., 2009). Underprepared students may find it more difficult to adjust their patterns of learning engagement — crossing the metacognitive threshold from "knowledge reproduction" to "knowledge construction" requires more "un-learning" than it would for those from more advantaged backgrounds (Bradbury & Miller, 2011, p. 8). There are suggestions in the data that some students encountered greater challenges of this kind — for instance, one participant was outspoken about the legacy of poor schooling he had to undo. Learner biography is also implicated in the pervasive low-grade anxiety and self-doubt many participants conveyed. The intersection of learner biography, including school history, and threshold concept learning in the South African context is worthy of further investigation. More broadly, it is worth exploring how students may be supported to develop self-efficacy

and other components of psychological capital with which to face liminal learning challenges.

The centrality of students' goals and associated learning behaviour in the study findings indicates that sensitivity to variation in, influences on, and impacts of those goals may inform how educators prepare to help students navigate disciplinary learning. Issues for further research emanate from the broad question of how to encourage a shift towards a goal orientation that leads students to use deep rather than surface learning approaches (Jackson & Ross, 2005). Findings suggest that students' goal orientation will be influenced by personal biographical factors and their intersection with the discipline as they experience it. The latter encompasses pedagogical approach, course content, and assessment practices (Biggs, 1996; Valle et al., 2003); if the discipline as experienced is meaningful and identity-relevant, students are more likely to develop mastery goal orientations and use deeper approaches. While the intention is not to evangelize, or expect every student to be inspired to major in economics, there is merit in considering how the use and relevance of the discipline may be made more evident to all students. Possibilities suggested by the study findings include providing opportunities for students to reflect on their learning, encouraging them to apply disciplinary ideas in their own lives, and to consider relatable real-world applications rather than sterile, contrived examples. Although highlighting the role of goals again appears to transfer much of the responsibility for learning to students, the teacher's role remains critical, since the pedagogical relationship affects the extent to which students appropriate the curriculum in ways that are meaningful (Barnett, 2009).

Making room for students to reflect on their learning includes developing their metalearning capacity, which has long been advocated within the TCF (Meyer et al., 2009; Ward & Meyer, 2010). Beyond this, encouraging them to reflect on the extent to which their longer term goals and career choices are personally meaningful may foster the development of goals consistent with their self-construals, rendering their studies more meaningful (Vogel & Human-Vogel, 2016) — an important consideration in view of the relatively high number of participants who had changed degree direction over the course of their studies.

The meaningfulness of the discipline as experienced is strongly tied to questions of affect and values. Important areas for future research to inform practice centre on how

economics educators may account for and harness affect and values, in curricular as well as pedagogical choices, to enhance teaching and learning. These questions become all the more pertinent in view of the lasting impact of the global financial crisis on the status of the discipline (Colander, 2013), the South African context of inequality and widespread economic disempowerment, and the current turmoil in South African higher education, where vocal and sometimes violent student protests against university fee increases have recently begun to include calls for "decolonizing the curriculum". Some disciplinary introspection is called for to understand why economics may be experienced as irrelevant, alienating or immoral, and the extent to which pedagogy and curricula may be rethought to address these concerns in our context.

The ways in which cooperative learning pedagogies may provide affective support to learners have been noted above as an area deserving further investigation. Curriculum and content choices may also be reviewed to account for affect. For instance, Menzies (2009) reports on teaching activities where students learn about poverty, equity, welfare and rights-to-pollute in affective ways; using emotion and empathy as pedagogical tools increased student interest and motivation, connected their learning to reality, and enabled critique of narrow neoclassical analysis. Similarly, Wight (2012) describes using classroom activities to let students uncover alternative ethical theories to the neoclassical, while Colander and McGoldrick (2009) advocate greater use of "big think" questions, as described in Chapter 2. Including questions of policy and moral philosophy, and real-world issues about which students care, into mainstream undergraduate economics may enhance its meaningfulness and identity-relevance. At best, such topics are usually addressed only in level 3 or postgraduate courses. There is a case to be made for introducing them in level 1 and 2, for reasons of relevance and meaning, and in the interests of equipping students — most of whom do not continue to major in economics — with a more complete perspective. To reiterate Siegfried's (2009) point, developing an economic gaze should include knowing when it is appropriate to think like a (neoclassically trained) economist.

A few participants alluded to possible cognitive dissonance between their own altruistic values, and the self-interest inherent in (neoclassical) economics. While the data did not allow me to establish whether this hindered learning for any of them, the question of a values clash warrants further investigation to explore whether it may be a significant

obstacle, and if so whether there are particular contextual or individual factors making it more so. The possibility that some of the discomfort associated with learning disciplinary content may be a chafing at students' moral and community regard places a responsibility on teachers to include in the curriculum consideration of the limitations and flaws of, and alternative views to, neoclassical theory. Instead of foreclosing debate with a façade of ideological neutrality, a curriculum that acknowledges complexity and ambiguity and allows for debate would serve to reconcile cognitive dissonance that students (and teachers) may experience with regard to implicit disciplinary values.

More broadly still, this question relates to students' "becoming" through the discipline. The suggestion that one's identity is formed in part by the standards embedded in the discipline (Barnett, 2009) offers a compelling reason why economics educators should not deal only in neoclassical, *homo economicus* values. This in turn points to much bigger questions about the role of higher education, and the kinds of changes we hope to effect in students (Barnett, 2009; Land, 2016). In the more immediate realm, further attention should be given to identifying, and exploring ways of fostering "ethical and affective proficiencies" to complement cognitive curriculum goals in economics (Bloemhof, 2012). Moreover, research seeking to identify possible threshold concepts within alternative paradigms would be useful from a teaching perspective, and would also speak to the debates outlined in Chapter 3 about the contested and culturally situated nature of disciplinary threshold concepts (Cousin, 2008).

Some of the implications I have drawn here may appear to propose fitting more into an already overstuffed curriculum, but this is not the intention. The TCF advice that educators seek out the "jewels in the curriculum", to allow some decongestion and a focus on "really useful mastery" (Land et al., 2006, p. 198), offers valuable direction. Findings suggest that there is scope in the current case to streamline the content of level 1 and 2 modules, since much of what is covered in level 1 — but not always satisfactorily understood by students — is revisited in level 2. Consideration of alternative pedagogical approaches such as the flipped classroom would also allow for more efficient use of class time.

Two sets of implications for practice in the specific context of the case also suggest themselves. First, it seems there are many aspects that we are not making explicit enough in teaching level 1 and 2 modules, such as the 'rules' of modelling, and the

rationale behind particular constructs, with the result that students may enter level 2 without full understanding of implicit rules or particular threshold concepts — and may experience ever-deepening stuckness unless they are able to navigate their way to a learning breakthrough, as happened for many participants through tutorial activities and discussion. It may make sense to review the curricula of level 1 and 2 modules together, to identify appropriate "jewels" and apportion their coverage, allowing for contextualization, application and opportunities for student reflection.

The second set of immediate implications centres on current assessment practices that, the phenomenon of passing without understanding suggests, may not always accurately capture learning. Most lecturers have discipline-specific (rather than formal educational) background, and may not have sophisticated knowledge of assessment theory (and practice). For instance, my observation suggests examiners rarely apply taxonomies in setting and evaluating assessment tasks. Related to this is the possible disjuncture between the levels of instruction, and of assessment. A high quality, more demanding instructional mix that integrates assessment with teaching would orientate learners early — and continuously — to assessment expectations (and thereby perhaps also mitigate anxiety related to unclear expectations). Professional development in this regard may enhance the reliability of assessment practices, although resource constraints on the implementation of more reflective and accurate practices will have to be contended with.

Finally, any meaningful change in pedagogical approach is likely to entail some transformation on the part of teachers (Higgs, 2014; Savin-Baden, 2016); changing our conceptions of knowledge, learning and teaching may well be experienced as a significant threshold, with attendant troublesomeness and the pull of the familiar conspiring against change. Research into teachers' conceptions and experiences of teaching and learning in undergraduate economics in South Africa (Ojo, 2016) was not considered within the focus of this study, but would be a useful complement to my findings in future investigations. This line of research would include exploration of the dominance of the lecture as pedagogy in economics in the South African context, to identify possible explanatory factors additional to the oft-cited perceptions of inputs and costs (Goffe & Kauper, 2014), and to explore enabling measures that may facilitate and support these shifts for academics.

10.5 Towards a model of economics students' learning in a TC-infused higher education programme

To realize deep, transformative disciplinary learning, students have to engage both head and heart in the process. In the tutorial programme, the pedagogical approach of cooperative learning in the peer group supported cognitive and metacognitive shifts, as well as affective, conative and identity-related responses. The schematic in Figure 16 offers a view of students' learning in the programme.

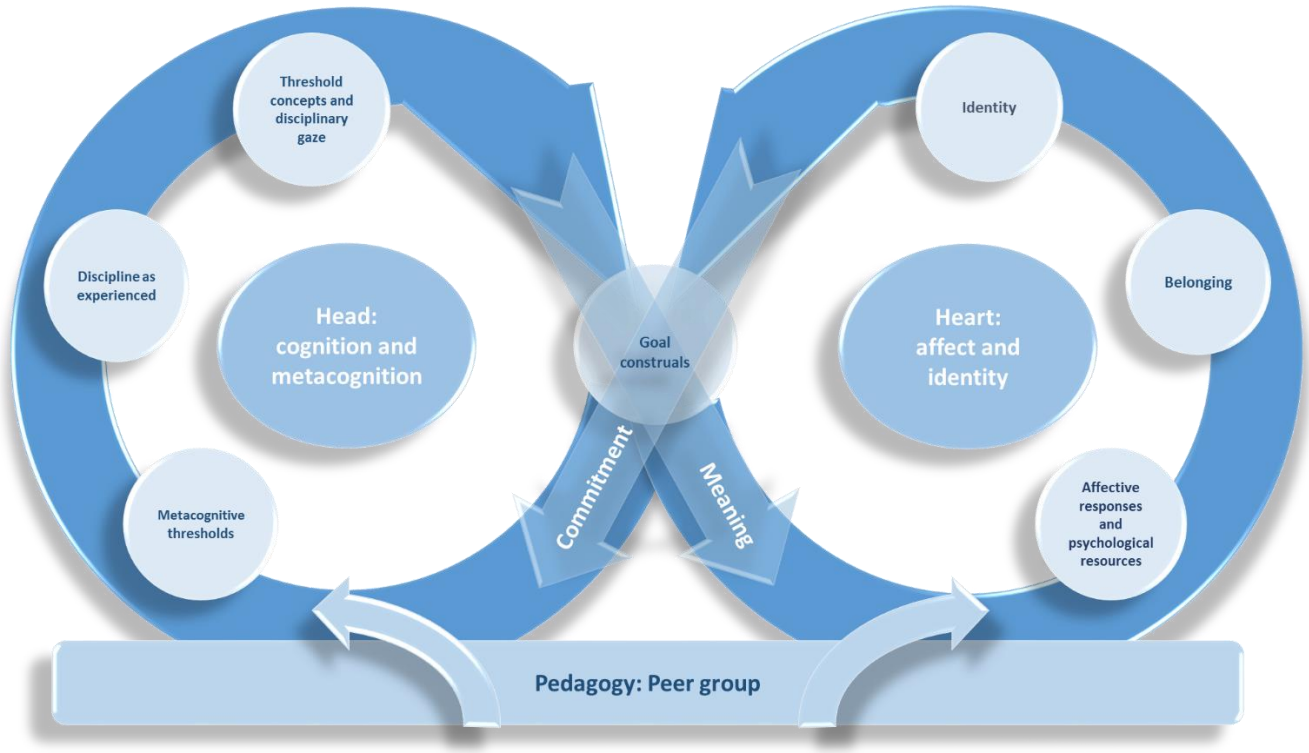

Figure 16. A model of economics students' learning in a TC-infused programme

The diagram shows students' learning as comprising two loops: the Head and Heart aspects are equally important, connected, and — potentially — mutually reinforcing in a perpetual process of growth and transformation. The figure of eight or lemniscate in the schematic evokes the continuous and non-linear path of transformative learning, and recalls the structure of the SID representing participants' understandings of their learning, from which this tentative model is abstracted. Each of the Head and Heart

loops shown above has interrelated components, or elements of learning and transformation, depicted in the seven discs. These elements are not sequential, nor are they discrete; they mutually affect each other, and their influences infuse into the overall flow. Each element may vary in 'value' according to individual or context. Thus elements may be experienced as positive or negative, conducive or not, complete or partial. Optimal learning will be favoured if all take on positive or conducive values; on the other hand, variation in each can, in interaction, give rise to a multiplicity of different individual experiences and consequences of learning. Together, these elements may be used to explain 'the happy path'[38] of disciplinary learning in the programme, and also to suggest possible reasons why, despite their positive appraisals of the peer group-based pedagogy, some students did not realize deep and transformative learning.

The model as portrayed in the schematic shows that learning is supported by the pedagogical approach — cooperative learning in the peer group — which positively influences both Head and Heart aspects in a multitude of ways. The constructs or elements of learning represented in the discs are briefly elaborated in the paragraphs that follow.

Embarking on deep disciplinary learning requires that students cross metacognitive thresholds. Learning requires them to see knowledge not as a fixed body of disciplinary 'truth' to be absorbed and reproduced, but as being socially constructed. Accordingly, conceptions of learning shift from a focus on memorization, to a process of understanding based on "knowing why", in which they are active and capable agents. In their transformative and enabling capacities, these changed views of knowledge, learning, and self as a capable learner may be characterized as metacognitive thresholds to further (disciplinary) learning, which must be crossed if students are not to remain stuck in superficial learning. In the tutorials, processes of discussion and articulation allowed students to construct conceptual understanding, and prompted them to revise their conceptions of knowledge and learning. Together with the enabling cooperative approach that transferred much of the responsibility for learning to the group, this fostered a view of themselves as capable learners.

[38] A term borrowed from software modelling, to describe the process when everything goes as it should and there are no exceptional or error conditions.

The discipline as experienced comprises students' encounters with economics through their studies, including in this case both mainstream lectures and the tutorial programme (and for some, extracurricular exposure such as intrinsically motivated reading on economic issues). The discipline as experienced is determined to a large extent by teachers' curricular and pedagogical choices. The tutorial programme seemed to enhance the discipline as experienced for many students. The emphasis on application and use of relatable real-world examples allowed them to see the use of concepts in context and thus experience their learning as meaningful, while the empowering pedagogical approach amplified the sense of disciplinary self-efficacy that arose as they recognized their own progress in conceptual learning.

The progress of disciplinary learning entails coming to understand particular concepts and techniques. This process may be characterized as crossing conceptual thresholds, as portrayed in the TCF (Meyer & Land, 2003), because of the transformative, integrative and troublesome nature of reaching understanding. Cumulatively, these conceptual transformations give rise to a disciplinary gaze — a transformed way of viewing and interpreting real-world events. This is accompanied by increasing fluency in the language through which disciplinary understanding may be expressed. The shift in subjectivity resulting from this new perspective on reality can change learners' sense of self. Group discussion and articulation in the tutorial programme were key cognitive processes that facilitated students' (re)conceptualizations and understanding of economic concepts and techniques. Learning in this way also promoted use and mastery of the disciplinary discourse, which was both a means and an expression of learning. The sense of common purpose and emerging disciplinary identity within the peer group seemed to encourage students to embrace new perspectives and practices, easing incipient shifts in identity.

Students' construals of their goals in relation to learning exist at the intersection of cognitive, discipline-content elements and affective, identity-relevant aspects of learning, and play a central role in motivating and guiding their learning choices, behaviour and achievements. Goal construals include whether students have a performance or mastery goal-orientation, which is closely tied to whether they will tend to take a deep or surface approach to disciplinary learning. Moreover, goal construals include the extent to which students have formed reflective, long-term goals based on a

sense of autonomy and a perception that their learning in the discipline contributes to their plans and aspirations in some way. Goals are malleable and dynamic, and may be influenced by the other elements of learning. The tutorials seemed to contribute to students' goal formation in several ways, including giving them time and reason to reflect, building a sense of capability and self-efficacy in the discipline, enhancing the relevance of the discipline as experienced, offering a safe environment to accommodate and encourage a mastery orientation, increasing motivation through a sense of common purpose, and fostering identification with the peer group and the emergence of a disciplinary identity. Because goal construals are closely tied to identity and shaped by feelings, they connect the cognitive and largely conscious elements of the Head loop with the affective and personal Heart loop.

A range of emotions arise from, and impact upon, the elements of learning; these make demands on learners' psychological resources. Together, the interplay of affective responses and psychological resources constitute an important element of learning. Affect may be evoked by any aspect of learning, including the pedagogical approach, disciplinary content, assessment practices, and other features of the learning environment; affective responses are widely variable, and may be strongly positive or negative. In the tutorials, students expressed strong emotions associated with the peer group and learning approach, their engagement with content, the processes and outcomes of assessment, their awareness of disciplinary mastery, and their own personal growth. Effective learning requires that students modulate the negative and harness positive emotional responses, drawing on their internal psychological resources — the conative and affective intrapersonal constructs that sustain commitment to learning goals and enable persistence in the face of difficulty. These might include fortitude, determination and resilience, self-belief, optimism and hope. Importantly, these resources are not fixed and may be supported and developed in the course of learning.

The element of belonging in the context of students' learning represents the extent to which the learning environment fosters a sense of safety, comfort and community that enables the expression of their developing disciplinary understandings and emerging identities. A sense of belonging — within the peer group, the institution, or the discipline — supports affective, identity-related aspects of learning. The tutorial programme appeared to provide needed opportunities for social integration and growing

friendship networks. Furthermore, the peer group and pedagogical approach created an emotionally supportive learning environment that offered ‘refuge and prospect’ to students — a risk-free space in which to rehearse economic WTP, and to find their disciplinary voice.

Students’ identity or self-concept affects and is affected by the progress of their disciplinary learning. This sense of self includes appraisals, values and aspirations originally formed by individual biography, which may evolve to include a stronger disciplinary identity in response to changing perspectives, personal growth and increased capacity for self-expression in academic and social domains. In the tutorial programme, the students’ sense of belonging was instrumental in facilitating their ‘becoming’ with regard to the discipline. As they identified with the group of fellow economics students (or in some cases with the wider community of economists), and became more proficient in the discipline and more confident of their own abilities, many appeared to experience an expanded and clearer sense of themselves.

Considering the overall working of the model requires a closer look at the connection of Head and Heart loops. Congruence between the discipline as experienced and students’ self-concepts can foster mastery goals and identity-relevant, meaningful learning, leading to positive affective responses and affirmation of identity. In the schematic in Figure 16, this is portrayed by the ‘Meaning’ arrow linking the Head to the Heart loop. Affect in turn influences and is mediated by goals, as learners draw on their individual psychological resources to bring about a commitment to learning choices and behaviours, which in turn lead to positive impacts in cognitive and metacognitive learning domains. This effect is shown in the ‘Commitment’ arrow from the Heart to the Head loop. On the other hand, if students’ goals as informed by their future self-construals are not served by the discipline as experienced, the Heart loop may not be activated, and learning may stall at a superficial level as students’ affective and conative resources will not be sufficiently engaged to sustain them through the challenges of disciplinary learning. The importance of the nature of individual goal construals is evident, because commitment would be fostered by students’ having reflective, learning-oriented, longer term conceptions of their goals, in terms of which their disciplinary learning may be perceived as relevant to their career plans, or simply to their sense of themselves in the world. Short-term, utilitarian goals focused only on

passing the module would be unlikely to activate the Heart loop or motivate students beyond a surface approach to their disciplinary studies.

The model suggests likely locations of systemic failure, manifesting (in TC terms) as stuckness, defensiveness, or a flee response. A few possibilities will be noted here. Students may not progress in disciplinary learning if they have not breached metacognitive thresholds — in other words, if their conceptions of knowledge, learning, and themselves as learners are not aligned with the requirements of higher education. A lack of identity-relevance and self-congruence of the discipline as experienced would suggests that the Heart loop — and the self-investment it brings — would not be fully engaged, and the vectors of meaning and commitment would not be available to sustain and energize learning. Insufficient self-belief, resilience or other intrapersonal resources, perhaps as a result of individual biography in interaction with the current learning environment, may be a further reason for students' learning engagement to fall short of its potential. Finally, if students do not feel a sense of community or membership but instead feel alienated or isolated in the institution, the discipline, or the course of study, their self-investment, commitment and learning achievements are likely to be curtailed.

Viewing students' learning in this way may suggest promising points for supportive intervention to enable and facilitate learning, some of which are noted in the implications discussed in section 10.4 above. The model accommodates the possibility of some scope for redemption (or substitutability) across some of the elements, which might ultimately enlarge the range of options for helpful intervention available to teachers, even in the face of relatively less tractable exogenous factors. For instance, a student may not feel strong identity congruence with the discipline as experienced, but could still be encouraged towards commitment and self-investment by virtue of the social integration the peer group affords. The extent of this type of compensation across elements remains an open question.

Figure 16 depicts the system of learning as resting on the processes and interactions engendered by the peer group-based pedagogy, which supported and sustained both Head and Heart loops. In reality, variation in individual biography and self-construal, as well as personal context or "noises off" the stage of disciplinary learning (Cousin, 2014), will affect how students engage with, experience and are transformed (or not) by

learning, so that the impacts of pedagogy may not be predictable or uniform. Nonetheless, it seems reasonable to suggest that peers and pedagogy can enhance the meaningfulness and identity-relevance of the discipline as experienced for many students in the ways suggested here. This representation of students' learning may also be used to explore the impacts of different pedagogical approaches. For instance, if the pedagogy supporting learning in this case were to be replaced with exclusively lectured delivery, or with a flipped classroom approach, we might speculate about the likely impacts on the remaining constructs, exploring how each element in the Head and Heart loop, and the system of learning as a whole, might be affected by a change in the pedagogical basis.

10.6 Concluding reflections

The answers abstracted from participants' descriptions of their learning in the TC-infused programme seem larger than the questions that precipitated them; they offer an encompassing, detailed, qualitative view of economics students' learning that goes beyond issues of disciplinary difficulty or local context. The model developed in section 10.5 offers a conceptual and graphic representation of these tentative answers, in terms of which disciplinary learning may be understood as a challenging and transformative process. Crossing the learning thresholds that constitute disciplinary mastery requires a sense of capability, as well as self-investment and the engagement of students' cognitive, conative and affective resources. If the discipline as experienced aligns with students' values, identity and goals, learning is more likely to be experienced as meaningful, facilitating the engagement of intrapersonal psychological resources that sustain academic commitment and in turn enhance cognitive and metacognitive development. In the tutorial programme, the pedagogical approach contributed to learners' sense of autonomy and capability, supported cognitive processes of conceptual learning, and offered a sense of belonging and an emotionally supportive learning environment. It appears that for many students, this promoted discipline-self congruence, enhanced learning, and facilitated the emergence of an expanded and clearer sense of self — which may be viewed as a central objective of learning in higher education. Rather than closing the questions, these incipient answers may serve to open

up our perspectives on what it means to learn and to teach in economics, and in higher education.

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APPENDICES

APPENDIX 1: REQUEST TO CONDUCT RESEARCH

COLLEGE OF LAW AND MANAGEMENT STUDIES
SCHOOL OF ACCOUNTING, ECONOMICS & FINANCE

King Edward Avenue, Scottsville, Pietermaritzburg
Private Bag X01, Scottsville, 3209, South Africa
Telephone (033) 260-5296 Fax (033) 260-6051
Telegrams University Telex 643719

Prof. A. M. Singh
Dean and Head of School: Accounting, Economics and Finance

13 May 2014

Dear Prof. Singh

PERMISSION TO CONDUCT RESEARCH AS PART OF PHD QUALIFICATION

Name:Jessica Goebel
Student no: 862868694
Dissertation:Students' acquisition of threshold concepts in undergraduate Economics

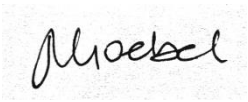
I am registered for a PhD in Education and plan to undertake data collection from August 2014. I propose to gather data from questionnaires, interviews, participant tutorials and student writing, and request your permission to invite students in Economics 202 (Pietermaritzburg) to volunteer to participate.

Your assistance in permitting access to the Economics 202 students will be most appreciated. Please be assured that all information gained from the research will be treated with the utmost circumspection. I will strictly adhere to confidentiality and anonymity.

If permission is granted, it is required to be in writing on a letterhead signed by you.

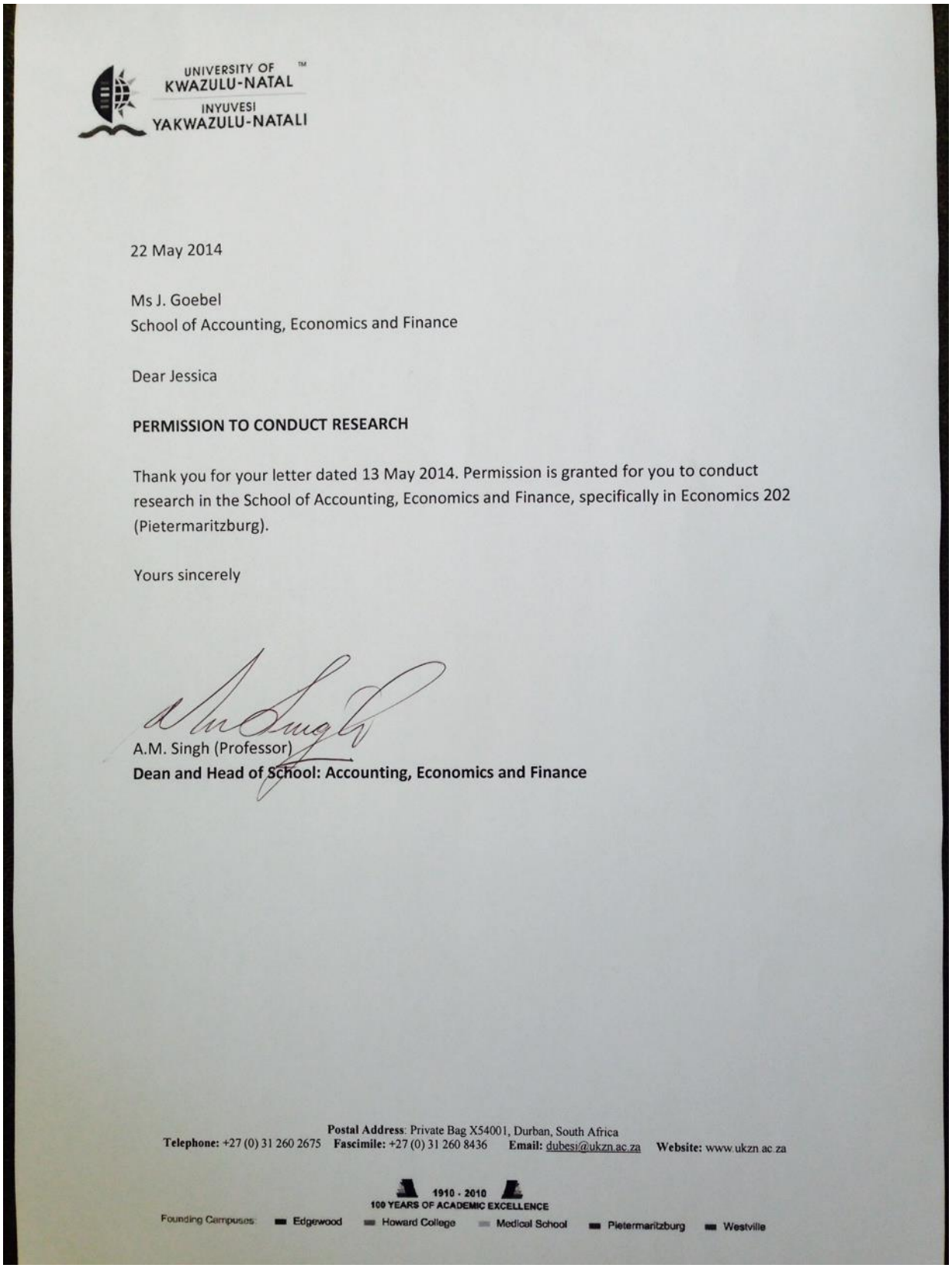
Thank you for your assistance in this regard.

Sincerely



Jessica Goebel
School of Accounting, Economics & Finance

APPENDIX 2: PERMISSION TO CONDUCT RESEARCH



UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

22 May 2014

Ms J. Goebel
School of Accounting, Economics and Finance

Dear Jessica

PERMISSION TO CONDUCT RESEARCH

Thank you for your letter dated 13 May 2014. Permission is granted for you to conduct research in the School of Accounting, Economics and Finance, specifically in Economics 202 (Pietermaritzburg).

Yours sincerely

A.M. Singh (Professor)
Dean and Head of School: Accounting, Economics and Finance

Postal Address: Private Bag X54001, Durban, South Africa
Telephone: +27 (0) 31 260 2675 **Fascimile:** +27 (0) 31 260 8436 **Email:** dubesi@ukzn.ac.za **Website:** www.ukzn.ac.za

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APPENDIX 3: ETHICAL APPROVAL

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

23 June 2014

Ms Jessica Luise Goebel (862868694)
School of Education
Edgewood Campus

Protocol reference number: HSS/0617/014D
Project title: An investigation of students' acquisition of threshold concepts in undergraduate Economics

Dear Ms Goebel,

Full Approval – Expedited Application

In response to your application dated 06 June 2014, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Professor SM Maistry
Cc Academic Leader Research: Professor P Morojele
Cc School Administrator: Mr Thoba Mthembu

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
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Website: www.ukzn.ac.za

APPENDIX 4: INFORMED CONSENT

COLLEGE OF LAW AND MANAGEMENT STUDIES
SCHOOL OF ACCOUNTING, ECONOMICS & FINANCE

King Edward Avenue, Scottsville, Pietermaritzburg
Private Bag X01, Scottsville, 3209, South Africa
Telephone (033) 260-5296 Fax (033) 260-6051
Telegrams University Telex 643719

Dear Student

I am conducting research into students' learning of economic concepts in Economics 202 at the University of KwaZulu-Natal, Pietermaritzburg.

The research is being undertaken by me, Ms Jessica Goebel, Senior Lecturer in the School of Accounting, Economics and Finance, to fulfil the requirements of a PhD in Education. My contact details are: Room 324, New Arts Bldg, Pietermaritzburg campus, UKZN. My office telephone number is 0332605520; email schroenn@ukzn.ac.za. Further information on the project may be obtained from my supervisor, Prof. S. Maistry, Edgewood campus, UKZN, office telephone 0312603457.

I wish to obtain your consent to conduct a focus group discussion and an individual interview with you, and to draw on your course-related written submissions (assignments and learning journal), to consolidate my study. The focus group, interview and journal writing will be about your views on learning economic concepts. The duration of the focus group and interview will be about 60 and 30 minutes respectively. Video and/or audio recordings will be made, and discussion will be transcribed and coded for study. Your transcribed interview will remain confidential at all times, and your anonymity is guaranteed. This will be achieved through the use of codes and/or pseudonyms. The transcribed interview will be kept in a safe place within the School of Education as per research requirements. At the end of five years the transcribed interview will be destroyed by shredding.

Please note that your participation in the study is voluntary, and a decision not to participate will not result in any form of disadvantage to you. Participants have the right to withdraw at any stage and for any reason without any negative consequences.

DECLARATION OF CONSENT

I …… (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, without any negative consequences, should I so desire.

I hereby provide consent to:
Audio-record my interview and focus group discussion YES / NO
Video-record my interview and focus group discussion YES / NO
Use of my written work for research purposes YES / NO

…… ……

SIGNATURE OF PARTICIPANT **DATE**

APPENDIX 5: TUTORIAL TOPIC LIST

Tutorial session	Activity	Concepts / learning focus
1	ETC Microeconomics Exercise 1: selling footballers (Davies & Mangan 2006c) Additional recent & SA examples	Opportunity cost; marginal costs & revenues; optimizing
2	ETC Exercise 2: High fashion at low prices (Davies & Mangan 2006c) Used example of a South African retailer	Equilibrium; price and other allocation mechanisms; modelling
3	ETC Exercise 3: Take-away curries (Davies & Mangan 2006c)	Modelling; marginality; diminishing marginal utility
4	ETC Exercise 4: Pricing for profit: Car parking (Davies & Mangan 2006c) Added discussion of local Midlands Mall parking charges	Marginality & profit maximization; modelling
5	Adapted from ETC Exercise 6: Student discounts on Greyhound bus fares (Davies & Mangan 2006c) (Replaced rail fare example with Greyhound bus and used South African pricing information)	Elasticity, market power, price discrimination
6	ETC Exercise 5: Pricing music downloads (multimarket price discrimination) (Davies & Mangan 2006c)	Elasticity, price discrimination, market power
7	Game theory intro: Prisoners' dilemma chocolate money game in pairs, discussion) Two team game & analysis Two more matrices in groups	Incentives, rationality, Nash equilibrium, strategy, behavioural economics
8	ETC Exercise 8: Cruise ship pollution: An economic problem? (Davies & Mangan 2006c)	Welfare & efficiency, market failure, externalities, incentives
9	Common property resources game, discussion questions (Hazlett 1997)	Rationality, externalities, common pool resources, incentives, welfare & efficiency

APPENDIX 6: REFLECTIVE WRITING PROMPTS

Tutorial session	Reflective writing homework task
1	Complete the Reflection section at the bottom of p6 of the ETC exercise; write your response to the last question ('Do you understand what important insights are added by the economic approach to this decision?') in your reflective journal. Also in your journal, write about half a page reflecting on this tut and on your expectations of this group & programme.
2	Write about half a page reflecting on today's exercises, and your thoughts on the use of **modelling** techniques in Economics. How well do you think you understand the 'how' & 'why' of economic modelling? How have you experienced the process of learning these techniques so far? (Also feel free to add anything you'd like to about how you're finding the tuts including social aspects, groupwork, format, what seems to be working for you or not, etc.)
3	Write about half a page reflecting on today's tut, and (if you like) on the forthcoming class test.
4	Write a half-page summary on market power and the firm's pricing decision that you could use later for revision purposes (i.e. how a firm should decide on what price to set, and how this is affected by whether it has market power [price elasticity of demand is important here]). You can also include reflections on tut 4 if you like.
5	In your journal (e- or paper), reflect on your understanding of 'elasticity'. Has your understanding changed as you've moved through Econ 101 & 202? Has it affected the way you see or understand other concepts? You may also find it useful to write up your reflections from this tut exercise and on your test preparation strategy in your journal (and if so I'd love to see them ☺).
6	In your journal (e- or paper), reflect on your performance in Test 1. You may want to consider: Was your mark in line with your expectations & a fair reflection of your learning on the module as well as the test preparation work you put in? What factors were the main drivers (good or bad) of your performance? Are there gaps in your conceptual understanding that you need to address – i.e. are there concepts in the test you are 'not getting', & if so which ones? What steps you will take to improve or maintain your performance in Econ 202?

7	In your journal (e- or paper), please reflect on your learning in Econ 202 and the TC tut programme over the semester so far. I would appreciate your insights on any aspects of your learning in these. How are you learning the concepts (if you are!), and why? To get you started e.g. do you find your understanding of some of the concepts we've focused on has changed? What factors are making it easier or harder for you personally? (Anything – old habits, school experience, the material itself, new experiences, new skills or approaches, your own predisposition, personal circumstances, whatever…)
8	In your journal (e- or paper), please reflect on a learning experience where you had an "aha moment", or when you (suddenly or finally) "got" something (preferably but not necessarily an economic concept).
9	In your journal (e- or paper), please reflect on how "what you came in with" has affected your learning in Economics here (UKZN, 202, and/or TC tuts). This could be anything – your own way of thinking about things before you ever studied Economics; what you learnt (or didn't) at school – skills, attitudes, good & bad habits as well as actual subjects; language, e.g. if English is a 2nd or 3rd language for you; other life experiences…

APPENDIX 7: FINAL ISSUE STATEMENTS

Issue statements for IQA Focus Group

In a few minutes I'm going to ask you to write on your cards & tell me about **your experience with learning Economics concepts** in Econ 202 and this TC tut group. (By your learning I mean your 'getting' economic knowledge, how you come to understand & know the concepts, not your studying e.g. for a test.)

- To begin try to get as comfortable as you can…
- Close your eyes (really)…
- Putting aside your thoughts of the day, take a deep cleansing breath.
- This semester you've been deepening your learning of Microeconomics, in Econ 202 and this tut group. Learning and progressing in Economics involves grasping some new ideas, & developing your understanding of some you already know…
- Now, imagine yourself learning Economics over the course of this semester… Remember the start of the semester, coming back after the vac… Econ 202 classes… joining in this study… our first meeting of this tut group… the web of concepts linking it all up… the exercises we've worked through… reflections you've written…

Reflect on your experiences of encountering new knowledge… Please tell about **your learning in Econ 202 (module overall and this tutorial group) this semester**.

Tell me about the process of learning …

- How have you acquired / 'got' / mastered new knowledge in Economics this semester?
- When & how did the 'penny drop' & you knew you understood something?
- What aspects of the programme 'worked' to help your learning?
- What aspects did you find difficult or challenging, and why?
  Were there areas where you felt stuck? If so, what helped you overcome that?

Tell me about the products of learning – what you learnt…

- Did your understanding of the 'web of concepts' or of individual concepts like opportunity cost, marginal costs & benefits, elasticity etc change?
- Can you describe specific skills, knowledge or qualities you've developed?
- Has learning in Econ 202 and/or this group changed the way you think about some things?
- Did your understanding of your learning itself change? Did you gain understanding of what are problem areas for you?

Tell me about your feelings - how it felt to learn…

- How did it feel to learn new economic knowledge this semester?
- How did you deal with negative emotions?
- How did you feel about the tutorial group?

Tell me about your sense of yourself in this process…

- Have elements of your own particular history, circumstances, or character affected the way you've learnt, or your feelings about this learning?
- Do you feel you've changed at all as a person as a result of studying Econ 202 & being in this group? Changed the way you see yourself? See the world?

Now, tell me about your learning in Economics this semester. Reflect on all the thoughts you had about your learning. There are no right or wrong answers… You are the expert – this is about **your learning in Econ 202** and this tut programme.

Write these thoughts down on the cards.
Write one thought or one experience per card, using words, phrases, sentences or pictures. All thoughts are ok – don't analyze, just write – this is about your experience, & no one will criticize your thinking. Write as many thoughts as you can, one per card, until you've run out of ideas (or I ask everyone to stop).

(About 15 mins)

My own notes for the next phase of the focus group (based on Northcutt & McCoy 2004)

Next: Collect all cards & randomly attach to wall. START RECORDING.

Clarification of meaning: I or someone from class reads each card aloud. Clear & in agreement on the meaning of each? (Anyone may express opinion – they belong to all now.)
Do we want to add any more responses? (More time if nec.)

Next: Participants
1) silently review all the cards, &
2) start grouping them (silently) into similar themes – cluster and group them into whatever categories you think they belong, in columns. Don't defend your choice; if a participant disagrees, may move it to another cluster. Move, sort and shift til everyone is satisfied.

Next: we identify labels or names for each cluster (and maybe sub-themes within each one).
Descriptions refined & narrowed (merge or divide if nec) til we all agree on the meaning; give it a title on orange card & stick at top of columns.
(Affinity is:

- Not a person, place or thing (unless metaphorically)
- Homogenous – one construct
- Easy to define
- Can have a range (eg Emotions)
- Doesn't depend on another in its definition (no th coding yet) – ie each can stand alone)

Title: word play humour or metaphor is good if it helps make sense of the data.

Flags: recurrences & patterns (point out & confirm with group); metaphors & symbolic language (is the meaning understood & shared by all?); 'rituals'.

Look out for: similar names; different / opposite names (may be polarities of one)
Minimize conceptual overlap
Difficult to name should maybe be subdivided
Do the easy ones first

Affinity descriptions: I will write up later based on group discussion. Needs to incl detail, contrast, comparison, richness. I will email to participants before, and let you check them next Wednesday – when we will also do the final step (in this part), identifying relationships between themes – cause & effect.

Anonymising – circulate list.

APPENDIX 8: FOCUS GROUP AFFINITY GENERATION

Below are the responses participants generated, clustered into affinities and named in the first focus group session. Index cards were typed up verbatim. Affinities were checked and revised in the second focus group, before confirming the affinity write-ups presented in Chapter 5.

Positive Outcomes

Comprises 2 sub-affinities (in the second focus group, the group decided to split these so that each became an affinity in its own right):

Group Dynamics

- TC seemed more helpful than the lectures / lecture content. NOT lecturer.
- Sharing the knowledge I already had with other made to know econ even better.
- Amazing sometimes
- Found the tutorials to be important to my learning
- Enjoyed attending the tuts hence why I never missed 1…
- Working through examples – writing not just reading
- People's views
- Knowing I'm not alone I the Econ struggle lol!
- MB≥MC in this tut
- Safety net
- Playing games to help understand concepts
- Discussing ideas / concepts ion TC groups of 4 diff people = diff explainations
- Going back from the 1st day til now, I see change
- The tut grp was helpful
- Gained and lost confident
- Tuts were intellectually stimulating
- Enjoying help of other through learning process
- Learnt a lot from my peers in discussion
- Discussions in groups were amaizing
- Sharing of ideas taught me a new way of thinking
- TC group caused me to view econ in another way
- TC made me feel more confident
- Group discussions help develop my knowledge in economics
- I learnt how to use economic terminology
- Want more tuts
- Study group helped with studying for test 1
- Revisit economic concepts learned in the past
- Helpful peers
- Team work is awesome
- Group discussion
- Jessica facilitated our thinking and work environment
- Group discussions

- The group (TC) opened up my mind (deep understanding)
- We began using economics in our daily conversations (we = my friends + I)
- Know on how to put my understanding in to practice since I able to understand through practice
- Economics makes one make good informed decisions
- Tut made econ 202 easier to study for tests - econ made more sense
- I loved meeting new people and sharing ideas
- I found out that it is much easier to base economic terms to real life scenarios
- I found that learning is much easier when you learn with other people, other than sitting with a book alone.
- The TC is like family to me.
- Communication with Jessica
- W/sheets helped with communication.
- Met new people, who to this day I still don't know their names.

Personal Outcomes

- Great experience
- New ideas
- Get knowledge
- Get experience
- New mantra (with a swoosh – a reference to 'just do it til MC = MB')
- Opened up my general knowledge
- Got to have words to use wrt thinking like an economist
- Sometimes I listen to music while I learn, just to set the ambience, it actually helps me to understand & concentrate
- I found my true love "Economics"
- Jessica open up my mind I like the way you teach ☺!!
- Eye opener
- Open minded
- Mind opener
- Sometimes I get carried away in learning new things i.e. I end up using the time I could be using for something
- Products of learning: able to tackle economic problems with a better knowledgeable manner
- Grew in understanding
- First few TCs is where I got the most utility
- New relationships. Friends.
- Learned to be comfortable around my peers.
- Confidence
- Self confidence
- Gained more confidence
- I can talk about economics on any other courses with confidence
- I learned a lot both academically & as a person
- Learning something new is always good only if you get it
- Confident

- Apply economics in every aspect of life
- Understanding fast
- Learned to link concepts – practice
- Enlightening
- Know how the graphs work and you're set
- Exploration
- Got to grow as a person
- It's felt scary to learn new things at first
- Self-discovery * see IG post
- Improvement in communication
- No more hidding my thoughts
- Learning styles (a ref to Learning Styles workshop run by Student Counselling)

Journey (the Learning Journey)

(in the second focus group session, the group renamed the sub-clusters here *Learning about Learning* and *Stumbling Blocks and Successes*)

- I need to get rid of this mentality of "if I at least know 60% of the work, I'm ok"
- There is so much more knowledge when we are a group
- Saw economics as a cog in a machine that most people are unaware of. Economists being the exception.
- Only did my reflections on a Monday morning 😐
- Economics is not as complicated as I thought
- Welfare still puzzles me
- Learnt a lot about other people
- Connecting dots
- Having to learn on how to think more broadly about the aspect of the day
- Can't get a handle on ***all*** those graphs
- The concepts as a whole are theories of things we see and experience every day
- Solutions??
- No more memorizing instead of understanding
- Great understanding of price discrimination
- Broadened econ perspective on life - everyday living
- Rebirth
- A lot of Aha moments
- Learning new concepts (say the chapter is on game theory, I would first write down on a piece of paper what I know about game theory, literal meaning)
- At the beginning I was anxious and nervous
- Products of learning: I am now focused on the economic & finance world and want my share of the pie
- Using 'not serious' example
- Concepts understood in a more interesting way
- Market power was quite interesting to know
- Tut helps to improve the application of things learned in class
- The beginning of every tut group was scary for me – fear
- Youtube videos were very helpful and useful (clarify: links on website? Own search?)

- Using logic and what I would do in everyday life to grasp concepts
- I gained more of an interest in myself in becoming an economist during this process
- Isoquants were a problem… overcame by talking to Jess & Thando
- I enjoyed the market structure section
- Learned new concepts such as game theory
- 'Dah' moments (clarified as like an aha moment but "duh!" because now it seems obvious and you feel you should have got it long ago)
- Sharing of ideas
- I feel tired at times
- To get unstuck I turn it into tut exercise
- I agree with the notion that learning is going through a tunnel
- In learning new things it helps to go over that thing often bcos the fifth (5) time I might catch something that I did not get at first
- Journey
- Listening to how others interpret things
- Graphs (I've learned I have not grasped graphs so much yet, I still find them bit difficult)
- Learning concepts of opportunity costs, partial equilibrium & elasticity was expanded through reflections
- Learning new concept some nice & challenging
- Reflections formed part of revision
- I loved econ because of the TC group. It was more fun and understandable because of the games
- Loved writing the reflections until I had like 3 tests in 1 week
- I find learning exciting, it's like being given an armour for battle
- My ability to analyse helped me to quickly understand about weighing cost and benefits opportunity cost
- Understanding lectures ↑ attendance
- The tuts helped me understand the example in the book
- I became more enthusiastic about economics
- The TC (tuts) provided an inviroment where I can talk about econ in a relaxed situation
- +10% helped me pass T2! Thanks ☺
- Don't overthink in economics (clarified as need to develop the ability to focus on relevant concepts in problem solving)
- My economics journey was overwhelming

Challenges / "Stumbling Blocks" (a sub-affinity of Journey)

- Difficulty in understanding elasticity
- I like the substitution and income effect! Graph!
- As if a cloud of fog lifted understanding economics through discussion was helpful ☺
- Procrastination is my nemesis
- Time management became a problem (lots of outstanding reflection) (a reference to the reflective writing homework)
- Stuck on other econ disciplines such as the nash equilibrium
- 😐 not too sure about welfare & efficiency
- Was stuck with elasticity (the calculation) at some stage

- Stuck on elasticity
- Was stuck with the word opportunity cost
- Elasticity still raise my blood pressure
- Forgetting the name of key economic concepts although I could explain and apply them
- Other aspect difficult to grasp and get us to
- Difficulty in understanding MC & AC… actual application
- Not easy to grasp other concepts

Economic Thinking

- Smarter
- Everyone in this world should do economics even if it's 101
- Enlightening to see how others view the concepts
- Engaging practically with peers
- Finally got opportunity cost
- When I learn a chapter I quickly read through the whole chapter, after that I start afresh with a slow pace & go through the chapter again with an idea of what's happening
- I want to stop saying uhm… (sign of not being sure)
- Don't have an Aha moment STILL
- Incentivized with fire to learn
- Being part of the TC group made me feel kinda important. Valuable.
- Economics is everywhere around us.
- I learnt everything in this world has a price. There is a scarcity of resources (things) available to a few.
- Reason behind concepts
- Concept e.g. marginal cost & benefit still trying to get used to.
- MC = MB
- The game theory tut helped me understand the chapter better
- I want a wife who is going to maximize my utility
- I've come to understand why people make decisions that they make
- Opportunity cost became my favourite concept
- Use of visual aid made learning easier
- I learnt that the economic models used can help in understanding the concepts.
- Gripped the concept of elasticity (with 2 graphs sketched)
- I learned how to read a monopolists quantity to produce [that graph]
- Every time I come to the TC I come out with something new
- Overcoming of the aspect that were difficult through giving it more time to focus on.
- Graphs.
- (A graph – can't read y-axis)
- Some concepts can be used together to make sense.
- Learning economics was also very challenging
- Intimidating at first but worth it in the end.
- Felt less pressure to understand concepts at first glance. Felt great learning and attaining economic knowledge.
- Everybody uses economics in their life somehow
- I think differently

- Still think economics has a place in the world
- I learned to apply Econ in real life or use its concepts and terms on a normal day
- Analytical – the group exercises had real world examples and I could use real world examples to analyse the situation in the exercise.
- I was very happy when I finally understood about elasticity
- Finally get very well the concept of elasticity
- Applying econ concepts to real world (i.e. shopping)
- I can now think out of the box
- Aware of my surrounding environment
- (graph showing SS DD intersection) Became clearer
- Breaking down graphs
- Too many graphs ☹
- (sketch of a lightbulb) finally grasping what 'marginal' means
- Elastic vs inelastic (2 graphs – horizontal easy to pull & vertical not easy to pull)
- Equations to explain graphs
- ↑ saving better budgeting
- Clear understanding of some of the concept through application to the real situation
- Found case studies to be my foundation of learning
- Notes started to decrease because conversing helped us to just know
- At first I thought I would come to the group to relax from studying but I found that I did more studying there
- I find it fascinating learning new concepts, the thought of knowing something that a lot of ppl do not know is fascinating
- Opportunity costs: ruined my life…. Can't make a decision without crying over what I gave up
- Tuts were encouraging
- Thinking like an economist
- The concept of logic of choice has now been incorporated into my life as I now look to maximize my benefits / purchases.

Goals

- I want / need to be an economist
- I want to write / have an economics textbook to my name
- Future economist – goals
- Note to self! Range Rovers are owned by hardworking people
- Accomplishment
- Future plans refined
- Thinking like an economist or manager

Feelings

- Loved random food during tuts
- Yum-yum in my tum-tum
- Exciting ☺ ☺
- Increased my confidence ☺
- Fun x 6

- ☺ (sketch of grinning happy face) Me, when I finally get a concept
- Was fun
- Sketch of big ☺ x 2
- Fun to learn with people with the same interests
- Wednesdays!! Sketch heart & ☺
- Meeting new people
- I made new friends (sketch 2 hearts)
- Test 2 ☺
- I love the tuts group
- Was very excited about being chosen to be a part of the group
- Worth it
- Fun & exciting to some extent of the module
- Felt good cause people would listen when I speak in the TC tut
- It was fun to be in the group
- Engaging
- Interesting x 2
- Joyful
- Will miss Chaka's comments
- Jessica ☺ #wcw
- Eco 202 lecturer was easy to listen to compared to previous lecturers in ecos
- I think I now LOVE economics ☺
- Fun and a great experience
- Fascinating
- Test 1 ☹ (tearful face)
- Healthy work environment
- Feels like home
- Loved it (heart)
- Probably still will never do ecos 3 or recommend eco modules to kids I like
- Whenever I felt stressed, I just took a walk
- Was excited about meeting new people & getting to know them.
- Challenging
- It was a little overwhelming
- Also learning new things is stressful
- Journals provided positive & negative thoughts
- Disappointment
- Hated test 1 results
- TC groups are amazing!
- It was fun working as a group
- Met new amazing people
- Intimidated – the first day of the tut I was a bit intimidated, especially by my peers because I thought I did not know much about economics as I was not doing well, but I was driven by the thought that it would help me.
- Not my fav module at first, understanding makes it more fun.
- Beneficial
- Fast

APPENDIX 9: SUPPLEMENTARY GRAPHS

The graphs below are supplementary to Chapter 5 and offer alternative ways of expressing the Pareto Principle for determining the optimal number of affinity relationships to include in the Interrelationship Diagram. These are a graphical illustration of the arguments in the paragraphs immediately following Table 1 in section 5.2.2.2.

Figure 17 plots each affinity pair relationship's contribution to the number of relationships (blue bars), and to explanatory power (red bars). The gap between the two (power) is maximized at 16 relationships.

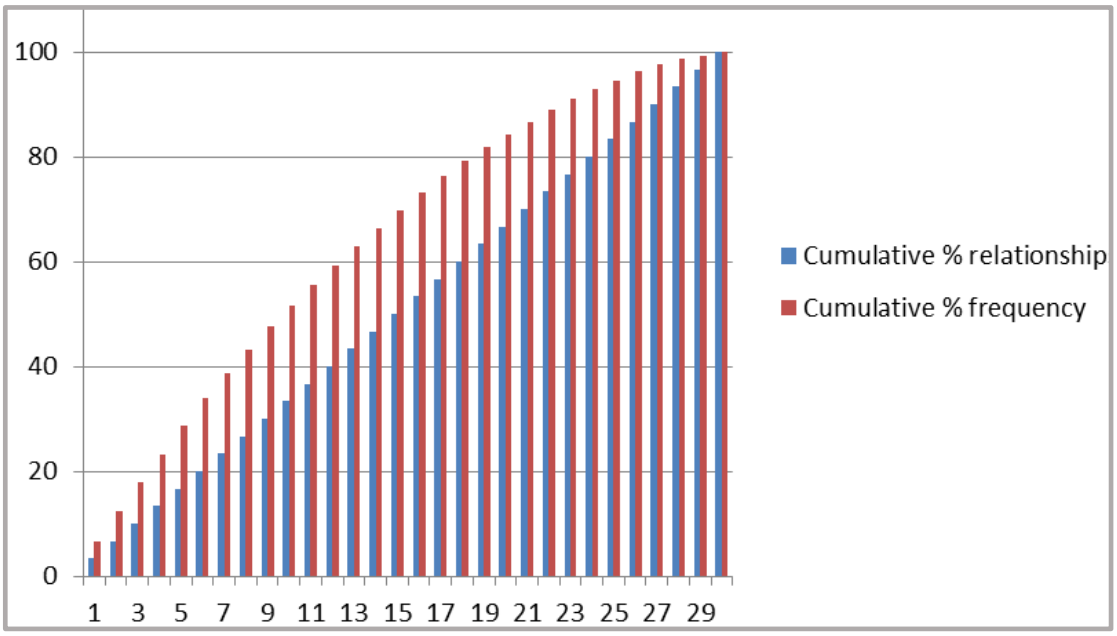

Figure 17. Cumulative percentages of affinity pair relationships

An alternative representation is shown in Figure 18, which plots power against the total number of relationship pairs; again it is evident that power is maximized at 16 relationships.

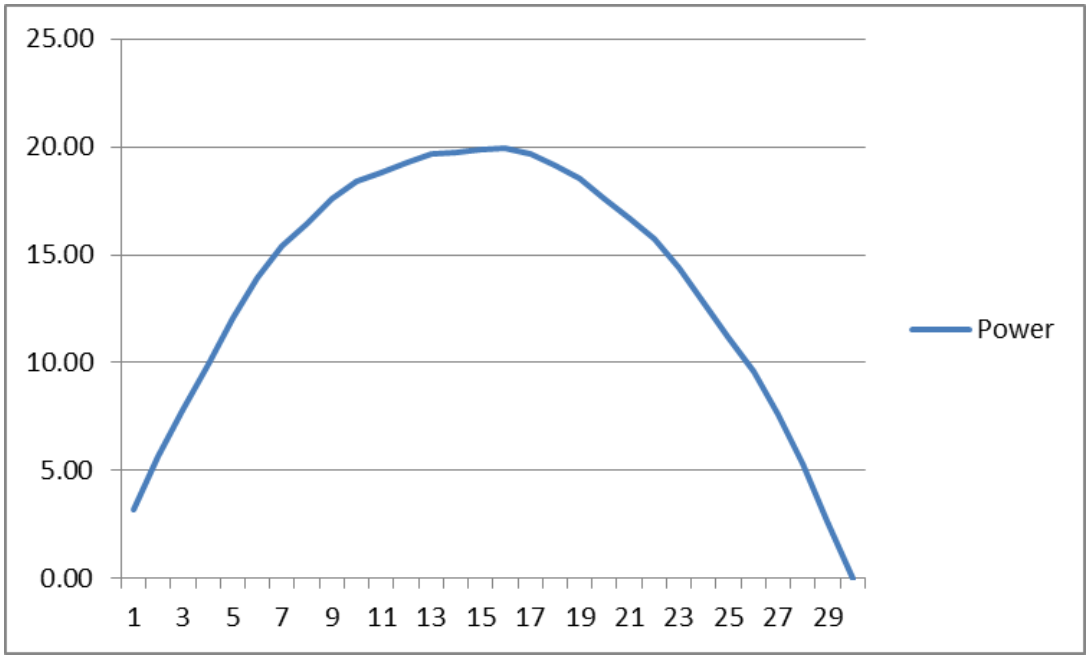

Figure 18. Power to total relationships

APPENDIX 10: INDIVIDUAL INTERVIEW PROTOCOL

Individual Interviews

1. Thanks - confidentiality of the interview - will be recorded, & I will later transcribe it but you won't be identified by name in any parts I use (will use the pseudonym you chose if names are used).

2. Outline my study in general & recap affinities identified by focus group.

3. Start audio recording.

4. Brief bio info

5. Axial interview: Experience the student has had with each of the affinities? (Making sure the experience is clearly and thoroughly expressed. Probing questions may allow for a richer or more in depth account.)

6. Theoretical interview: Relationship or connection between each pair of affinities? Refer to their filled in forms. Discuss all pairs, relationship or not.

7. Ask if they have any final thoughts.

8. Thank interviewee for their time & participation**.**

Interview protocol: Axial interview

The focus group identified several common themes or affinities that describe their learning of economics in Econ 202 and the TC tutorial group. Let's look at each of these themes one at a time, and you can tell me about your experiences with each. (Please be honest – I'm hoping to deepen understanding of how students learn so I'm looking for real reflections, & I won't mind if some of it is not flattering...)

1. Economic thinking

This describes the economic approach to analysing problems that participants identified as an important part of learning. Tell me about what your experiences with economic thinking – what it has meant to you.

2. Feelings

This represents the range of emotions students experienced while learning Econ 202 and participating in the tuts. Tell me about feelings.

3. Goals

The 'goals' affinity refers to future plans or aspirations which some students noted as elements of their learning economics. Tell me about goals.

4. Journey (the learning journey)

The Journey affinity is about your progression or path in learning economics, which entails a shift in 'where you are' in your understanding over time. It is made up of two sub-themes: *Stumbling Blocks and Successes*, and *Learning about Learning*. Tell me about your experience of the learning journey.

How did 'the penny drop' for you with certain economic concepts? How did you 'get unstuck'?

5. Group dynamics

This refers to the positive outcomes of the social / group work elements of the TC tuts. Tell me about your experience of the group dynamics.

6. Personal outcomes

This affinity is about the personal growth or development students described as resulting from their participation in the tuts. Tell me about your personal outcomes.

Interview protocol: Theoretical interview

Many of the themes or affinities identified have some kind of relationship; one affects or causes the other. Tell me about your experiences with such relationships. Let's look at each theme, and you tell me more about if or how it relates to each other theme, for you. For each relationship, please give me a specific example of how the relationship has affected your experience in learning Economics (202 & TC tuts) this semester.

Affinity name:
1. Economic thinking
2. Feelings
3. Goals
4. Journey:
Stumbling blocks & successes
Learning about learning
5. Group dynamics
6. Personal outcomes

Possible relationships:
A → B
A ← B
A <> B (no relationship)

AFFINITY RELATIONSHIP TABLE

Affinity Pair Relationship	
← / → / <>	
Economic thinking	**Feelings**
Economic thinking	**Goals**
Economic thinking	**Journey**
Economic thinking	**Group dynamics**
Economic thinking	**Personal outcomes**
Feelings	**Goals**
Feelings	**Journey**
Feelings	**Group dynamics**
Feelings	**Personal outcomes**
Goals	**Journey**
Goals	**Group dynamics**
Goals	**Personal outcomes**
Journey	**Group dynamics**
Journey	**Personal outcomes**
Group dynamics	**Personal outcomes**

APPENDIX 11: CHANGE IN TITLE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

6 January 2017

Ms Jessica Luise Goebel (862868694)
School of Education
Edgewood Campus

Dear Ms Goebel,

Protocol reference number: HSS/0617/014D
New Project title: Students' learning of threshold concepts in undergraduate Economics

Approval notification – Amendment Application

This letter serves to notify you that your application for an amendment dated 9 January 2016 has now been granted **Full Approval** as follows:

- **Change in Title**

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study must be reviewed and approved through an amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

Best wishes for the successful completion of your research protocol.

Yours faithfully

.....
Dr Shenuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

Cc Supervisor: Professor SM Maistry
Cc Academic Leader Research: Dr SB Khoza
Cc School Administrator: Ms Tyzer Khumalo

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Website: www.ukzn.ac.za

APPENDIX 12: TURNITIN ORIGINALITY REPORT

Turnitin Originality Report
Students' learning of threshold concepts in undergraduate economics. by Jessica Goebel
From J Goebel 2017 (PhD Final)

- Processed on 10-Jan-2017 8:13 AM CAT
- ID: 757865943
- Word Count: 113488

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http://www.mcser.org/journal/index.php/mjss/article/download/3704/3629

3

< 1% match (publications)
Threshold Concepts in Practice, 2016.

4

< 1% match (Internet from 09-Oct-2011)
http://www.fctl.ucf.edu/ResearchAndScholarship/SoTL/creatingSoTLProjects/implementingmanaging/qualitativeresearchvalidity.php

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http://www.earli2011.org/media/Documents_EARLI2011/BookofAbstractsandSummaries.pdf

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http://economics.uwaterloo.ca/needhdata/documents/JoanRobinsononTeachingEconomics.pdf

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http://wiredspace.wits.ac.za/bitstream/handle/10539/20757/Final%20PhD%20Thesis%20%2818%20April%202016%29.pdf?isAllowed=y&sequence=2